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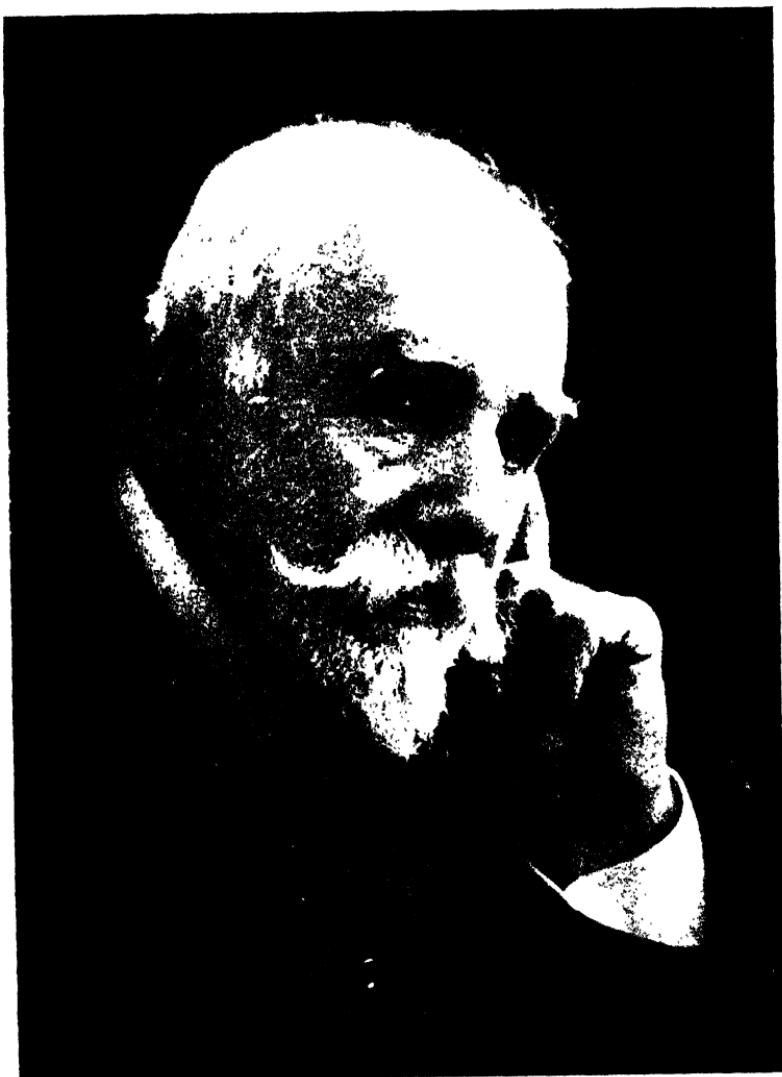
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"Most true it is, as a wise man teaches us, that doubt of any sort cannot be removed except by action; on which ground too, let him who gropes painfully in darkness or uncertain light, and prays vehemently that the dawn may ripen into day, lay this other precept well to heart which to me was of valuable service:—

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(CARLYLE, *Sartor Resartus*, p. 135.)"

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PREFACE.

I have known the subject of this memoir for the greater part of my life. As a child I enjoyed the tale he wrote called *Spiders' Spinnings*; later on in life I became interested in the story of his *Pocket Book of Engineering Formulae*, and in many of his opinions and writings on economic and social problems.

After reading various sketches of his life and work, the idea occurred to me that if these incidents of a remarkable career could be woven together into a connected story, they would form a volume of considerable interest to those who delight in reading biographies. For an account of his education, his start in life and his work as a whole I have availed myself of Sir Guilford's memories of his past career, and have also endeavoured to give brief extracts from his opinions.

Some have written of his simple habits of life, his unfailing courtesy and kindness, his keenness, his sense of humour and forgetfulness of self. In order, however, that I may not, as Sir Guilford has himself expressed it—"put him on a pedestal," it must be mentioned that one of his faults lay in the direction of expressing himself too strongly in his public writings, or, as a friend put it, of using "the bludgeon rather than the rapier," and no one has been more ready to admit the truth of this criticism than himself.

Not long ago it was remarked to the Editor, "Yes, I grant you Sir Guilford Molesworth is an authority on Ceylon and India, but what does he know of England?" The speaker had failed to realise that though Sir Guilford had spent over thirty years out of his native country

he had also spent over 60 years *in* it ; that during the greater part of this latter period he had taken the keenest interest in every economic and social movement ; that in early life he had formed the habit of noting down facts and verifying them many times before making them his own and using them ; that the story of the writing and constant revision of his *Rocket Book of Engineering Formulae* is the embodiment of the man's character ; his life, in fact, has been one long record of keen observation, logical deduction, patient verification, tireless energy and unceasing labour.

Sir Guilford believed that the secret of his success lay not in cleverness but opportunity :

" It was not any cleverness of my own ; I remember many years ago a former schoolfellow coming up to me and asking, ' Are you any relation of the great Mathematician ? ' ' Who do you mean by the great Mathematician ? ' ' Why the author of the Pocket Book of course.' ' Well I am the author of the Pocket Book, but no great mathematician.' "

His dislike of opinions put forward anonymously made him rigidly adhere to putting his name to everything he wrote, " Good or bad," he would say, " I am not ashamed to stand by my opinions, I dislike anything that is not open or straightforward."

He was not a " party " man, and had no confidence in the present party system. " They are all bad," he would say, " but it is best to vote for the side which promises least, as being nearest the truth." On one point he thoroughly agreed with Mr. Gladstone, viz. : " That politics blunt the moral perception."

Another point to be remembered is that to ensure perfect independence in his opinions, Sir Guilford made a practice of refusing any honorariums or payments for his articles or publications concerning economic or social problems. It was, in fact, a principle of his life never to reap pecuniary gain or

benefit for doing what he considered a public duty. Shortly before the Great War a friend of the writer, who was then a corporal of the Territorials, fell in with a sergeant of the Royal Engineers, and they went together to look at some feats of engineering. In the course of conversation the sergeant said:—"I'll tell you who was the best engineer I know of and a good master too, he always dealt with us straight and would have no go-betweens; saw to everything himself, he did. We thought a lot of him." "What was his name?" asked the corporal: "Sir Guilford Molesworth," replied the other, "but I don't think he can be living now." "You're wrong there," interrupted the corporal, "for I drove him up to our place, only the other day, and he was quite hale and hearty, although over eighty years old."

In the above incident the sergeant describes Sir Guilford as a master; whilst the following testimony, taken from official documents, refers to him as a servant of the State. Reviewing as a whole the results of Molesworth's work in Ceylon the Governor of that Colony expressed, on behalf of the Government, their high sense of his ability and engineering genius and their appreciation of:—

"the earnestness, sound judgment and administrative skill displayed by him during the course of his service in Ceylon."

The Secretary of State for India in 1878 wrote:—

"Mr. Molesworth's services have been of incalculable value to the Government of India. It would not be difficult to mention cases in which he has saved lakhs of rupees to the State."

And again in 1881:—

"Mr. Molesworth has rendered excellent service . . . His opinions on the points put before him have been most valuable . . . We consider him a most accomplished engineer, one fitted to advise Government on great engineering works."

Writing of Molesworth's work in India, Mr. Ernest Benedict, M.INST.C.E., says :—

"The account of Sir Guilford's work on Indian Railways would really be a history of them for the fourteen years during which he was responsible, in a very great measure, for everything connected with them, from the first crude proposals to the latest development of their traffic and general usefulness His character can best be described in his own words to the students of the City and Guilds of London Institute : 'The successful Engineer must study how to manage men, he must be endowed with a good temper, patience, strict honour and integrity, and he must be in the best sense of the word a true gentleman. The instincts to which I allude are those which would never unnecessarily outrage the feelings of another, but would consistently carry out the principles of our great Master in doing to others as we would they should do unto us.' 'In all these attributes,' writes Mr. Benedict, Sir Guilford Molesworth has ever been pre-eminent."

My thanks are due to Mr. W. J. Thorold for inspiring me with the title of this book (see his article in the *Canadian Mail*, September 18th, 1909); to Mr. Ernest Benedict, M.INST.C.E., for his memoir in *Indian and Eastern Engineer*, 1910; to *Men of the Time* (13th edition); to Mr. John Spon, for his careful revision of the text, and last but not least to Sir Guilford himself for allowing free access to his papers, and for being ever ready to answer questions.

THE EDITOR.

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*Bardil Baran Mukherjee
1 College Row, Calcutta,*

CHAPTER I

ANTECEDENTS

[T is not the purpose of the present work to enter into family history; but by way of illustrating certain characteristics of the subject of this memoir it is interesting to note those of his paternal great-great-grandfather and grandfather, Robert and John Molesworth, for which we have to go back to the 17th and 18th centuries:—

Robert was the son of Captain Robert Molesworth and Judith, his wife, the only daughter and heiress of Chief Baron Bysse, Recorder of Dublin. He was brought up at Brackenstown House, near Swords, in the County of Dublin, and was educated at Dublin University. He joined the revolutionary party, was attainted by King James' Parliament and his estate sequestered. But when William and Mary were established on the throne of England Robert Molesworth came into his own again and King William, "having a particular esteem for him," called him to

his Privy Council. In 1692 he was appointed Envoy Extraordinary to the Court of Denmark, which office he filled for several years, during which time he wrote an excellent account of Denmark.

He was also a Privy Councillor during the latter end of the reign of Queen Anne. In this capacity, however, his outspoken opinions led to his removal, yet he did not fail to continue to enter protests whenever he considered it needful. He is described in the Parliamentary Report on Manuscripts as "a man of some literary ability with a *considerable insight into economic problems.*" Sir Walter Scott also refers to him as "a distinguished Whig."

We are further told that the Molesworths were more honest than was the custom of the time; that they were decidedly talented and independent in their opinions.

In 1716 Robert was created Baron Philipstown and Viscount Molesworth of Swords, and on July 1st, 1719, he took his seat in the House of Peers.

He married Letitia Coote, daughter of Lord Coloony, and there were several children of the marriage. We are, however, only concerned with their fourth son Edward, who entered the Army and served in the Spanish War. After hostilities ceased he retired to Ireland, where he lived near his father,

at Knocksedan House, which he named "Buena Retiro" or "Happy Retreat." He married Marie Renouard, the issue being an only son John, who, owing to a remarkable facility for dealing with figures, became known as "John Molesworth, the Celebrated Calculator."

John married Frances Hill, but died when their son, John Edward Nassau, was little more than a year old. This only son was educated at Greenwich School under the then famous Dr. Crombie, and afterwards at Trinity College, Oxford, where he took his degree in 1811. Shortly afterwards he was ordained to the Curacy of Millbrook, a small village near Southampton, on a stipend of £60 per annum, which he held for sixteen years.

In 1815 he married Harriet, the sister of William Alexander Mackinnon, M.P. (Chief of the Clan Mackinnon) and of Dan Mackinnon of the Coldstream Guards, Wellington's favoured General, one of the heroic defenders of Hougmont at the Battle of Waterloo. Nine children were the issue of this marriage, the youngest being Guilford Lindsey, who was born at Millbrook on the 3rd of May, 1828. In 1829 the Archbishop of Canterbury was "pleased to collate the Rev. J. E. N. Molesworth to the Rectory of St. Martin's and the Vicarage of St. Paul's in

the City of Canterbury." Consequently the early memories of the subject of this Memoir which are given in the next chapter are chiefly connected with Canterbury.

EDITOR.

CHAPTER II

MEMORIES—CANTERBURY IN THE THIRTIES—
1830-1839

MY memories go back to the days when gas had not reached Canterbury, the City being lighted with oil. The method of striking a light was by flint and steel, combined with the tinder-box and sulphuric matches (sulphur-dipped matches). I remember the cry, "Half-past ten and a frost," from the watchman or "Charlie" who patrolled the streets at night, proclaiming the weather. He was the predecessor to Sir Robert Peel's modern policeman, the "Bobbie" or "Peeler." My father brought one of these new policemen into our dining-room and explained the wonders of his uniform, his truncheon, his large wooden rattle, his badge, and his chimney-pot hat which was stiffened at the sides with strips of whale-bone.

The pistols which my father used to take on a journey from Canterbury to London, to protect himself in case the coach should be held up by

highwaymen on Shooter's Hill, had flint locks. Even percussion caps were not then invented.

The old postal system of payment by distance was in vogue, in which the charge for a single sheet of writing varied from fourpence to a shilling, with double rates for a second sheet. This led to letters being crossed and even re-crossed diagonally, until they were illegible! Members of Parliament were allowed to issue franks, which were in great request, also the Mulready envelopes. The first issue of adhesive stamps was impressed on my mind by the fact that one of my schoolfellows, to whom one had been given, burnt it through trying to make it adhere like diachylon plaster, by heating it at a candle.

The first railway at Canterbury was constructed by George Stephenson to bring coal from Whitstable. It was six miles long, in four sections, three on steep gradients and one on a level worked by ropes. The fifth, being curved, was worked by a tiny weird locomotive, and when any difficulty arose with either the driver or the engine this section had to be worked by a horse. At that time gradients steeper than one in a hundred were deemed only workable by rope; this railway still exists and is now worked entirely by locomotives. The passenger train consisted of

one carriage, omnibus-shaped, to accommodate twelve passengers.

I saw Prince Albert when he spent a day in Canterbury as he was posting from Dover to Canterbury to marry our Queen; and when he visited the Cathedral a small schoolfellow of mine was pushed by the crowd against him and had his ears boxed by the Prince's father, to the boy's great delight.

MEMORIES—THE KING'S SCHOOL IN THE THIRTIES

The King's School, where my four elder brothers and myself received our schooling, had a good reputation for character and scholarship. The boys realised their part in maintaining the honour of the school, to which they generally became warmly attached. In my first year the five of us were together; my eldest brother William distinguished himself considerably as a scholar, John became noted for his strength and madcap pranks, which made him a hero with the boys; George was a great fighter; Renhell, otherwise nicknamed Rodney, did well in scholarship; but I gained no prizes except for French, which was owing to my being obliged to write out my lesson as a punishment so often that I became quite proficient.

What impressed me most were the school fights.

My first day began with about seven, under the supervision of George. Those fights were entirely without malice, many of the combatants being great friends in after life. Years afterwards, in speaking of Canterbury to Archbishop Temple, I said, "Behind those Norman arches were our favourite milling grounds." He at once became animated. "Ah! did you have fights?" Whereupon it became evident that he also had had *his* fights, and no doubt had also had his successes as a pugilist.

MEMORIES—BOYHOOD

Football was another great attraction. In those days we played Association, and in later years my old schoolfellow, Sir Alexander Rendal, told my wife how well he remembered seeing me as a very small boy emerging from under a heap of bigger boys at a football scrum. It was a delight to us in after life to revisit the scenes of our boyhood and to revive the happy memories of the past.

During our schooldays we had the advantage of a good home influence behind us. Our parents set us the best of examples in their own lives. My father was a strong character and whatever he did, he did it with all his might, and no matter how busy he might be never failed to keep in touch with his

children. He had a horror of anything like cruelty to animals and believed in Coleridge's axiom : " He prayeth well that loveth well both man and bird and beast." Our tame pets were many and various ; squirrels, mice, rabbits, guinea-pigs, pigeons, an owl, a hawk, a starling, a sea-gull, a snake, even toads were tenderly cared for. My earliest recollection is of a tame magpie pecking at my little bare legs.

My mother was gentle and retiring, devoted to her husband and children, and happiest in her own home, where she seemed always to be working for us. She had a great sense of the ludicrous and was always ready to enter into all our fun ; at the same time she was particular as to all the little niceties and courtesies of life, and her influence with her nine high-spirited children was invaluable.

MEMORIES—MINSTER—1838

In 1838 my father became Vicar of Minster in the Isle of Thanet. It was here that I contracted typhoid fever through inhaling the bad vapours arising from a cistern of foul water which was afterwards discovered in the corner of the room where I slept. (The daughter of the former Vicar had died in that room, probably from the same cause.)

Returning to the King's School, after recovering

from typhoid, I was unfortunate enough to be again taken ill, this time with scarlet fever, which was then raging at Canterbury; so once more my schooling was stopped for a time. In 1839 my father was appointed Vicar of Rochdale and went into residence there, but we younger boys were left as boarders at the King's School, Canterbury; until the summer of 1840, when my brother John, who was then articled to a firm of solicitors, took us up to Rochdale.

MEMORIES—ROCHDALE—1839

Arriving in summer we were delighted with Rochdale, and much impressed with the beautifully laid out Vicarage grounds, thickly studded with a great profusion of ornamental and other trees.

The people of Lancashire formed a great contrast to the people of the South, and until we got used to them we found their language almost unintelligible. Though rough in manner they were so genuinely kind-hearted that we soon learnt to love them. I remember being amused at hearing an old woman in a cottage say, "Eh . . . ! but Harry it's a loosty lass," which was meant as a high compliment to my eldest sister; and on another occasion: "Eh . . . I like Louisa, she's as plain as a factory girl," which was a compliment to Louisa's friendly disposition.

From Rochdale we were sent to school at Manchester, where the tone contrasted unfavourably with that of the King's School, Canterbury ; George, who was going into the Navy, was put into the Modern or English side, Rodney and myself into the Classical ; here, with the exception of French, I did no better. Indeed, I found my poor progress as a scholar of singular service to me, as from the disposition of the school furniture of the room and the position of the fireplace, my being at the bottom of the class brought me directly opposite the fire in winter, where I enjoyed the snuggest position in the otherwise cold class-room. But in French there was considerable improvement. One day, after I had done uncommonly well however, our French master said : " Now I am going to thrash all the bad boys in the school." He started off with George, Rodney and myself, ending up with two or three others, notwithstanding the excellent progress I had made, at least in French. The typical schoolmaster of that day was a stern man in a hard age, and fully believed in the sentiments expressed by the verse :—

" Spare the rod, spoil the child,
Is a maxim quite right,
So I flogs them all round
On a Saturday night."

Philip Braybrook was one of our senior school fellows for whom we had a great regard and whom I had the pleasure of meeting again in after years in his capacity of Government Agent for Central Ceylon.

Whilst at school at Manchester we witnessed the Chartist riots and saw the artillery placed at the end of the Oldham Road to check the rioters.

Though quite happy as fags ourselves, Rodney took it into his head that it would be right to abolish the system in our School House, so when we became faggers instead of the fagged we combined and threatened to thrash à much bigger boy who desired to retain the custom. We headed a revolt to enforce our views, and were successful in accomplishing our object. But after a trial we were forced to admit that we had made a mistake and that fagging was really good for the boys themselves.

MEMORIES—SWIMMING

Whilst at school at Manchester, Rodney and I took an annual ticket for the Dolphin Swimming Baths, where we learnt to swim and dive. Here I soon became proficient, which was not only serviceable to me as a youth but also in after life as the following incident will show. In our summer holidays we frequently went to Beaumaris in North Wales, and

on one occasion I was out with my brother John, who was a proficient sailor, in a little sailing-boat. The Liverpool packet had just started from Beaumaris pier and as we were sailing across her path I suggested to John that we'd better turn, but he said, "No! a steamer ought to give way to a sailing-boat." At the last moment our position seemed so perilous that he did put about; at the same minute the captain of the steamer changed his course to save us, with the result that he bore right down upon us while we were in stays so that we grazed the side of the packet, and the paddles didn't stop until we were almost underneath them. . . . I dived from the boat to get as far away as possible, but John was knocked over into the water, though fortunately unhurt. . . . A life-buoy was thrown to us from the steamer, which nearly struck my brother. I called to him to swim to our boat; he did so, we both climbed into it, and after baling out the water were able to row to the shore. Had we not been good swimmers we must have been drowned.

MEMORIES—PUTNEY COLLEGE—1844

At the age of sixteen I left school altogether. My own desire was to go into the Navy, but my father said one son was enough in that Service and on his

return from a visit to London with my elder sister Harriet he told me I was to be a civil engineer. They had brought back a syllabus of the College course and on reading through an appalling list classified under the heads of Mathematics, Chemistry, Geology, Geodesy, Machinery, Civil Engineering, etc., I felt the utter hopelessness of my ever becoming an engineer.

But it was my father's wish, and the accounts of life at Putney College as pictured by my sister were so alluring, that I acquiesced cheerfully.

Never having had any lessons in drawing I was sent to a mechanical draughtsman for a few weeks' tuition from the time I left school till I went to College. This was my only experience of lessons in the art of drawing.

Putney College had previously been the house of some nobleman who had sumptuously entertained George the Fourth. In the Dining Hall there was a splendid ceiling with a classical group in high relief representing a Banquet of the Gods. The grounds, sloping down to the Thames, were beautifully wooded.

A Workshop and Foundry, Laboratory and Museum were situated there. Our Professor of Chemistry was Dr. Lyon Playfair, afterwards Lord Playfair.

Separate studios were provided for students, of whom three were allotted to each room. Davidson, who afterwards became Surveyor-General of Queensland, shared mine and became my greatest chum. He was a junior student, being under sixteen, whereas I, being just over that age, was entered as a senior student.

My chum was known at College as Polly Davidson, owing to his pink-and-white complexion. After those Putney days we never met for fifty years, but our friendship was maintained by a regular correspondence throughout that period. My wife and daughter were afraid that Davidson and myself would be disappointed with each other when we met again but that was not so. He came down and stayed with us, and everyone was most favourably impressed with my old chum.

We students had great advantages in boating at Putney and our College "Four-Oar" had once beaten Oxford at Henley. My own "Wager-boat" was, at the outset, the first out-rigger and the lightest boat on the Thames, but so speedy was the progress in building racing boats in those days that it was comparatively a tub when I left the College.

Being a keen oar it was my great ambition to row in the boat which had belonged to "the Bow" of

the Oxford Eight, although it had the reputation of never going out without capsizing with its occupant.

My wish was gratified and all went well until a friend, spurring with me and rowing too close, nearly fouled me. I slightly drew in my oar and the boat immediately turned turtle ; my friend told me afterwards that he saw the boat going through all the jerky motions of swimming upside down, the fact being that my feet were entangled in the strap and I was unable to extricate myself ; but, eventually succeeding, I swam ashore, towing my boat with me, got the water out of it and went on again, feeling perfectly safe and in no danger of another capsize.

Smoking at school being forbidden gave it a zest, so I thought it rather a fine thing to do. Subsequently, however, the practice was allowed by the College authorities, with the result that the charm of the thing left me and I never again smoked.

Shortly before I entered the College the railway mania was at its height, and the demand for surveyors was so great that some of the senior students were engaged to survey prospective railways at five and ten guineas a day !

From an educational point of view I did not shine as a student ; no prize fell to my lot, and though the Principal of the College described me as " a studious,

painstaking person whose conduct was uniformly satisfactory," I incline to think even this verdict more favourable than facts justified.

In the engineering profession a prejudice existed against us college students, which was not unnatural, for we *were* somewhat conceited. On the other hand, the engineers of those days required an assistant to do exactly as he was told and not to "think for himself."

Students without *practical* knowledge are apt to be too well satisfied with their attainments, and their superficial knowledge is apt to lead them into error from too great a dependence on crude theory untempered by practice.

I have an amusing recollection of the visits of our college classes to railway works in progress, and of the manner in which, with our imperfect experience, we criticised the mode of construction and thought how very much better we could have done it!

I left the College perfectly satisfied that I had not much more to learn about engineering; but before I had been many weeks in actual practice I began to find there were *some* things I did not know. As time went on these increased in a marvellous way and now, after a long professional career, I have achieved a knowledge of my own ignorance and a conviction

that the education of an engineer is never complete.

Putney College was not a success financially, and was eventually sold, the buildings pulled down and a hideous terrace erected on the site.

MEMORIES—PUPILAGE—1846

About 1846 I went as articled pupil to Mr. Dockray, Chief Engineer of the London and Birmingham, now the London and North Western Railway. He at once appointed me Assistant Engineer, and from henceforth my interest in my work became really keen.

At first I was engaged in preparing the designs for widening the railway between London and Watford by the addition of lines entailing a second tunnel under Primrose Hill. I then surveyed and set out some of the Buckinghamshire branches of the London and North Western Railway, and was finally employed on the construction of a branch line.

Here I had the good fortune to be appointed assistant engineer to Mr. Henry Warriner, afterwards "Maudsley's engineer afloat," one of the best practical engineers I ever met, from whom I gained much valuable experience which was most useful to me in after life. His kindness to myself, then a mere

youth, I can never forget, and my Sundays were generally spent with him and his wife.

MEMORIES—APPRENTICESHIP UNDER SIR WM.
FAIRBAIRN—1847-1849

The next course in my education was owing to the advice of Mr. Wyndham Harding, a well-known engineer employed on the construction of the Summit Tunnel of the Lancashire and Yorkshire Railway. He advised my father that an engineer's education was not complete without a good workshop training, and on these grounds I was sent as apprentice to Sir William Fairbairn. Sir William was a splendid example of a class of men, then numerous in the manufacturing districts, who by their energy and intelligence had improved their position from that of a workman to that of an employer of labour on a large scale. He came to Manchester without a penny in his pocket, but, from working on piece-work and then taking petty contracts, managed to scrape together enough money to start a tiny millwright's shop on his own account; this did so well that, by degrees, he added three other huge establishments to his works in the vicinity of his original workshop.

He died a wealthy man, a baronet and F.R.S. . . . loved and respected by all who knew him, especially

his workmen. He was a perfect "Nature's Gentleman," and his manners might have put to shame many who had been born in a far higher rank of life.

Men of his class are seldom met with in the present day, when extreme trade unionism has reduced its members to one dead level ; discouraging overtime, piece-work and apprenticeship, which were formerly the ladders by which such men climbed to eminence.

I first worked as a millwright, which Sir William considered the best training for a beginner. A millwright was able to turn his hand to anything.

I subsequently worked as an engineer's fitter and well remember the dismay of a smart cousin (a colonel in the Hussars) calling to see me, when, in reply to sounding taps of a hammer, he beheld me emerging from the man-hole of a locomotive boiler as black as a sweep !

MEMORIES—EXPERIENCE OF A STRIKE—1847-49

It was during my apprenticeship at Fairbairn's that I gained practical experience in a strike—that of the "Amalgamated Engineers."

During the few weeks that elapsed between the notice of the strike and its outbreak there was plenty of opportunity for discussion. On all sides I heard :

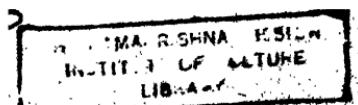
" Why can't they leave us alone ? We don't want to go on strike, we are doing very well as we are."

The demands of the Union on which the strike was based were for the abolition of overtime and piecework, for reducing the number of apprentices, and other changes. Now, overtime, being paid for by increased rates, was very popular with the workers and a great boon to men with large families ; while piecework enabled a good workman to get high wages and to raise himself to the position of a master.

I asked an intelligent man, with whom I was then mated, " Why don't you and men like you get on the Council of the Union and influence it for better ? You see what mischief they are doing ? " He replied, " What can we do ? When we've done our day's work we want to go home to our wives and families. We don't care to go blethering about the pot-houses, and it's just those pot-house chaps with the gift of the gab that have the say at the Union."

This I have found to be true, as those who prate most loudly on the wrongs of the working-classes are not representative of the British workman.

The orders of the Union, however, were not to be resisted, so the strike went on entailing misery on the families of the workers, ruin to employers and employed, and terrible loss of trade, until the funds



of the Union were exhausted and the strike collapsed ; and well it did, otherwise the trade must also have been ruined. Even as it was the strike enabled the foreigner to get a good grip on it, which he has maintained.

MEMORIES—COTTON MILL AND COAL MINE—1848-49

Subsequently I went to Portugal to erect an engine for a cotton mill, and afterwards was engaged on the erection of a 240 h.p. pumping-engine for a coal mine which was then the deepest in England. It was nearly half a mile deep and the winding-engine, working the rope at a very high velocity, was 170 h.p. The first time I descended the pit I remarked to the underlooker that we were going down very slowly, but he replied, "No ! we are going down very fast." It appeared that the engine-driver, knowing I was a novice, thought he would give me a fright, but it had the opposite effect.

MEMORIES IN THE FORTIES—PEOPLE I HAVE MET

My Uncle William (W. A. Mackinnon, Member for Lymington), when in London, kept open house at 4, Hyde Park Place. Agnes Strickland, Harrison Ainsworth, Mrs. Siddons, George Cruikshank and other interesting notabilities were among his guests.

Wyatt, the eminent sculptor, was dining there one night when talk began to run on his statue of the Duke of Wellington just erected opposite Apsley



GUILFORD LINDSAY MOLESWORTH, at the age of twenty.

House. A certain loud-voiced young officer was explaining to the company how the hoisting was done,

when a little man quietly interposed : "Pardon me ! It was not quite that way." The young man interrupted him, "But I tell you it *was* ! I had it from Wyatt himself." Here my uncle broke in : "Pardon ! Captain. I have omitted to introduce you to Mr. Wyatt !"

Amongst other celebrities I met Alexandre Dumas, Père, the author of *Monte Christo*. He was very amusing and monopolised the conversation, scandalising General Espinasse, A.D.C. to the French Emperor, by saying that English soldiers were superior to French, a sentiment indignantly repudiated by the General ; but Dumas retorted with a long string of battles in which the French had been beaten by the English. He said : "They met you at Agincourt, *chassé* ; at Poitiers, *chassé* ; *chassé toujours et partout, excepté à Fontenay.*"

MEMORIES—CHIEF ASSISTANT—1849–54

After serving my apprenticeship I was invited by Mr. Doyne, who had known me on the London and North Western Railway, to be his Chief Assistant in South Wales, where he had a large practice in surveying and constructing railways and other undertakings in connection with iron work. I remained with him for two years, when he went out

to the Crimea in command of the Army Works Corps.

Then being appointed Chief Assistant Engineer on the London, Brighton and South Coast Railway, amongst other duties I had to superintend the construction of a fourth line of railway between London and Croydon, a difficult operation, owing to the constant succession of trains. It was on the construction of the Low-Level branch to the Crystal Palace that I became acquainted with the London clay, and realised the truth of George Stephenson's saying that "it would run uphill rather than stand still."

MEMORIES—MARRIAGE—WESTBOURNE PARK ROAD

By this time I was engaged to be married, and my appointment on the L.B. and S.C. Railway being of a nature to justify such a step, it took place in August, 1854. We spent our honeymoon in North Wales and when we again returned to town, we lived in a tiny house in Westbourne Park Road which was then on the outskirts of London's West End. The dining-room of our small house was so minute that we could only use one side of the table, the other side being against the wall.

In this same year I was elected Associate of the Institution of Civil Engineers.

MEMORIES—DIFFICULTIES AT WOOLWICH—1854-55

About this time, owing to the Crimean War, an engineer was required in Woolwich Arsenal with a knowledge of machinery as well as of building, • to design and superintend work then urgently needed.

Sir William Fairbairn, who had been consulted, wrote asking me if I cared to take the appointment. I was to rank as Major in the Service and to have independent charge.

I accepted it . . . but my designs were subject to the signature of the Royal Engineer in control of that department and his interference rendered progress impossible. The first task to be undertaken was the building of a large factory for making Lancaster shells, then urgently needed for the Crimea. Being a rapid draughtsman, two days after receiving my orders I submitted my design for the signature of the R.E. He received it with "Excellent ! Mr. Molesworth, admirably suited to its purpose !" Then, after continuing in the same strain, he added : "But I think the windows should be a little further apart."

This change involved a fresh drawing which I submitted the next day ; it was received with similar approval but an alteration in the width of the

windows was required, and a third drawing had to be made and so on . . . until at the end of a month my design was no nearer completion than on the second day.

Meanwhile, in order to prevent delay I gave the Contractor a pen-and-ink figured sketch which enabled him to get out the foundations. But one day when going on his round, the R.E. Officer asked some questions of the foreman in charge who, in reply, produced my little rough pen-and-ink sketch. On seeing this the R.E. wrote to me stating that he held me responsible for the cost of anything which did not bear his signature !

I was exposed to similar interference with a large sawmill ; in fact, with every work under my charge. When I protested against the delay the R.E. said that he was responsible and that he could not sign the drawings until he was quite satisfied.

Seeing that progress was impossible I resigned the appointment, though it was a bitter pill to myself to give it up.

On my last day at the Arsenal, just as I was leaving, the R.E. Officer came to my office to tell me that the bedstones for the shafting on the wall of a sawmill had been bedded too high by eighteen inches. I felt very annoyed but not surprised because, in

having to carry on the work by pen-and-ink sketches instead of finished drawings, errors might quite possibly have crept in.

However, my successor told me that after the bedstones had been taken down at considerable expense, it was discovered that their original level had been correct !

MEMORIES—CONSULTING ENGINEER IN LONDON,
1855–58

My wife and myself continued to live at Montrose Cottage, Maryon Road, Woolwich, where our two eldest children were born. Soon after resigning my appointment at the Arsenal I was invited by Mr. Horner, formerly Chief Draughtsman at Fairbairns, to join him in partnership as Consulting Engineers in London.

This involved most varied and interesting work in designs of machinery of every description, in English and foreign railways, in designs of locomotives, and practical development of inventions. Most of my work consisted of designs " devilled out " by leading engineers to their less fortunate *confrères*. Lattice and brace girders were at that time new, and my previous experience in such girders in South Wales caused me to be in request as a designer of them.

In this way I made the acquaintance of many of the leading engineers in the profession.

When Mr. Horner retired on account of increasing years Mr. Edmund Edwards, one of my fellow apprentices at Fairbairn's, joined me and we became known as "Molesworth and Edwards." We worked in a little top story in Beaufort Buildings.

Here my greatest difficulty was with inventors, who were generally so in love with their inventions that it was almost impossible to persuade them they were valueless. Even when the invention was sound I sometimes advised the inventor not to patent it. My advice in these cases was generally neglected, but was subsequently justified as all these inventions failed financially.

There was at that time at the Patent Office a very suggestive object lesson : On each side of the entrance there was a door ; one bore the brass plate of "The Commissioner of Bankruptcy," whilst the other bore that of "The Cominissioner of Lunacy."

In 1856 I gave evidence before the Royal Commission on "Masters and Operatives," and Lord Goderich, afterwards Lord Ripon, tried to shake my evidence, which had been displeasing to him, for he had previously been a warm partisan of the Trade Unionists without understanding the subject.

Curiously I again came into collision with him in after years concerning other matters, when he was Viceroy of India. **16546**

In 1857 I submitted to the Council of the Institution of Civil Engineers a paper on "Woodwork Machinery," respecting which there was at that time scarcely any information or literature available. The paper was well received, and the Watt Medal as well as the Manby premium of books was awarded me for it.

MEMORIES OF THE FIFTIES—EXPERIMENTAL LOCOMOTIVE FOR METROPOLITAN RLY.

The Metropolitan Railway being in course of construction, the leading Engineer Mr. Fowler proposed, so as to avoid smoke in the underground, to construct a locomotive which was to be filled with super-heated steam. As I had previously done work for him I wrote expressing my opinion that the project would end in failure, and suggested that a locomotive should be used with a very large heating surface and worked by the accumulated heat stored up by that surface.

He accepted my suggestion and asked me to prepare working drawings for such a locomotive. These were duly executed and the experimental

locomotive was made at Stephenson's Works to my drawings, with some modifications suggested by the manufacturer.

Mr. Fowler said that I should have credit for this in due time, but in his speech at the opening of the railway he spoke of the experimental engine he had made, omitting any mention of my name in connection with it.

I spoke to Sir Charles Gregory about it, but he was not surprised. He advised me to take no notice, saying that as I had been paid for my work I could not say anything.

MEMORIES—LARKHALL RISE, PUTNEY HEATH, 1858–59

In 1858 when we were living at Larkhall Rise there was a slack time in engineering and, to use a friend's expression, "Great George Street was crowded by engineers with drawing-boards under their arms." During my leisure time at home I was engaged in making observations with the microscope which resulted in the production of *Spiders' Spinnings*. It was originally written for my children and I did not publish it until 1870. I had also begun working at the *Pocket-Book of Engineering Formulae*, but these things had soon to be put aside for more immediate requirements.

MEMORIES—CEYLON, 1859–61

Mr. Doyne, who had returned from the Crimea and gone to Ceylon as Chief Engineer to the Ceylon Railway Company, wrote to his Directors and, at his request, I was appointed Mechanical and Locomotive Superintendent.

Among other outfit for Ceylon I purchased a rifle, and the gunmaker suggested I should make a trial of it. His assistant took me to their trial rifle-range near their premises and, loading the rifle, made a very good shot about two inches on one side of the bull's-eye. He loaded it again and handed it to me. I landed a shot right in the centre of the bull's-eye. The man stared in surprise and I said, "Yes, that will do. I will take the rifle." Had I taken another shot I should probably have missed the target altogether.

Going out to Ceylon in '59, I was followed three months later by my wife and children in a sailing-vessel. The route they travelled was round the Cape, which was then a four months' voyage and a most tedious affair. Though everything was said to be provided there were many deficiencies. There was no stewardess on board and no proper facilities for families. For instance, the children had to be washed in a pie-dish, and necessaries were difficult

to procure as the stores had been much damaged while crossing the Bay of Biscay.

Shortly after my arrival in Ceylon matters became most complicated. The Gaddadessa Route had been chosen by Captain Moorsom who, after a hasty reconnaissance estimated the cost of the railway at



"BAGATELLE," Home in Ceylon.

£856,557 ; accepting this estimate the Government had granted a concession to the Company on favourable terms, *viz.* : six per cent. on all expenditure up to £850,000 and five per cent. on all beyond that sum. The detailed survey, however, proved that the estimate so hastily framed was wholly insufficient.

The difficulty of ascending the mountain zone was far greater than had been anticipated ; the proposed incline had to be increased from 1 in 60 to 1 in 50, and even to obtain that gradient it became needful to introduce two reversing stations.

Mr. Doyne, convinced that the selected line was the only locomotive route practicable, proposed to reduce the cost of ascending the mountain range by substituting a rope-incline with a gradient of 1 in 16, but even with this modification he estimated the total cost of the railway at £2,214,000 ! Alarmed at the enormous discrepancy between these estimates, the Directors decided to refer the matter to Sir Robert Stephenson, and Mr. Doyne was ordered to return to England to confer with him. Stephenson died before he could make a report and the question was referred to Mr. Hawkshaw.

In Mr. Doyne's absence I was appointed Chief Engineer, and shortly afterwards the Company's Agent retiring invalided, I became acting Agent as well, thus reducing the normal friction between the two officers to a minimum.

Pending the inquiry it occurred to me that a more favourable ascent of the mountain zone might be obtained on the flanks of the Allagalla Mountains, so with the consent of the Government I

employed the staff of engineers in surveying this route.

The result was highly satisfactory, a continuous gradient of 1 in 45 was obtained, effecting a saving of about five miles in the total length of the railways, while the work, mile for mile, was lighter than on the original track and less liable to landslips.

The saving on the incline alone amounted to more than £300,000, and a Committee of the Legislative Council was appointed to consider my plans.

In the meantime the Government had made an offer to the Company to take over the concern with its liabilities, paying it off at par. But I urged my Directors to adhere to their valuable concession, being convinced that the line could be completed by my route for £1,500,000, an amount to which the Colony was prepared to go. The Directors adopted my advice, but a number of speculators, in anticipation of a rise if paid off at par, bought in shares which were at a small discount and outvoted the Directors.

My having taken the part of the Directors against the Government made me exceedingly unpopular, especially with the Ceylon Press, which declared that my estimates were not worth the paper they were written upon, that my proposed Kandy route

was "a series of chamois leaps from one right-angle to another," etc. My friends wished me to answer these attacks, but my reply was "No! I shall live it down." The much-abused route was afterwards completed for a few hundred pounds within my estimate.

Afterwards when the railway was nearly constructed, the editor of one of the papers wrote me an angry letter to the effect that the editor of another paper had been taken up the line whilst he, who had been the only one to defend me in the early days of my unpopularity, had been excluded. I did not answer the letter but, meeting him a few days later, acknowledged its receipt adding, "but I don't consider myself under any obligation to you for not joining the other journalists in attacking me," at which he looked astonished; "because I presume you acted conscientiously in the matter, and if I thought otherwise I should have a much lower opinion of you than I have at present."

Needless to say, after this there were attacks on me in this paper that were defended in a way which made my case worse.

The agreement to take over the Ceylon Railway was signed on behalf of Government by my old schoolfellow, Philip Braybrooke, then Government

Agent for Central Ceylon. By this time most of my engineers had left Ceylon, only one or two being left to complete setting out the line on the banks of the Maha Oya. So wishing to complete the work, I went to the Maha Oya to help the engineer who was still at his post. Having had fever previously I naturally expected it again but it didn't break out until I had been six weeks at sea and was going round the Cape. Probably that sea voyage saved me from worse consequences.

MEMORIES—FROM CEYLON TO ENGLAND—1861

The fever had a peculiar effect on one's memory. When dictating a letter I broke down in the middle of a sentence, tried again and again but failed. In a similar manner, when attempting to explain to the Surveyor-General in his office the action of the barometer in mountain surveying I broke down and was so exhausted that there was nothing for it but to drive home and go to bed.

In 1861 I left Ceylon with my family never expecting to return, and when saying "Good-bye" my wife was not a little surprised at the remark of the Colonial Secretary's wife, who said to her: "Well! I expect we shall see you back again!"

As war was then expected between America and

England, Sir Charles Macarthy told me not to be afraid if we were taken prisoners by the Americans on our homeward voyage, as he had previously had that experience which had resulted in his having a good time in America. But it was a great relief on arriving at St. Helena to find the English and American ships lying peaceably in the harbour side by side, with their flags flying.

CHAPTER III

MEMORIES, 1861-1871.—ELECTED MEMBER OF THE
INSTITUTION OF CIVIL ENGINEERS; AND
MOLESWORTH'S POCKET-BOOK OF ENGINEERING
FORMULÆ, 1862. RETURN TO CEYLON AS
CHIEF ENGINEER TO THE GOVERNMENT, 1863

In 1862 I was elected Member of the Institution of Civil Engineers and completed my *Pocket-Book of Engineering Formulæ*. This latter had originated in 1846 when Mr. Dockray had advised me to keep a commonplace book and note down anything which came to my notice, even to the dimensions of a wheelbarrow. This I did in a large folio book and from it extracted a number of items that were in everyday use, entering them in a book of such size as could be carried in my pocket. These items increased to such an extent that it occurred to me to have them printed as they would be useful to myself even if the cost of printing were not met by the sale.

Having leisure in the interregnum, 1861-1863, I finished it in our little cottage on Putney Heath

with my two eldest children playing under the table. My wife helped me in all possible ways, and my father, who was staying with us at the time, wrote the first preface.

* I got stale over it and was beginning to lose heart when my wife came to the rescue : " You have spent so much time and labour on it," she said, " go and consult Sir Charles Gregory before you throw it up."

MEMORIES—THE STORY OF THE POCKET-BOOK

Sir Charles Gregory, was then one of the principal Consulting Engineers in Great George Street. After looking it over he said : " By all means publish it." So I took it to Weale, the great engineering publisher of the day, but he refused to have anything to do with it, saying : " There would be no demand for such a work." There had been pocket-books before, but this was an entirely new departure, mine was the first of its kind.

I then took it to Messrs. E. and F. N. Spon, who had a small shop in Bucklersbury, near the Mansion House. They looked at it, and Mr. William Spon said ; " A gentleman called here yesterday who asked us if we had any book giving information on super-heated steam and surface-condensation. Have you got that in your book ? " I at once turned up the

Gifford's *insectorum*

P = Pressure in inches of steam in atmosphere
 α = Density of water in gallons per hour
 T = Diameter of throat in inches

11

D = Diagram of throat in

$$A = .0155 \sqrt{\frac{G}{P}}$$

Gifford & Sholesworth

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pages of my MS., giving the desired information. They asked me four or five similar questions, all of which my MS. was able to satisfy, they then said : " Ah ! that will do. We will publish it." In 1862, as I was leaving Euston Station to return to Ceylon, my father handed me the first printed copy of my work.

Having been only too glad to get it published on any terms, as a useful book for the profession, it never occurred to me to make any agreement, either verbal or written ; but from that time until fifty-six years later, when the present representative of the firm, expecting to be called up for war service, suggested that in my own interests a written agreement should be drawn up, none such had been in existence. My confidence in my publishers, however, has been well justified, as they have acted throughout most honourably and generously, and increased the royalties without any request on my part.

The first edition of the pocket-book, which only consisted of 220 pages, passed through six editions in its first year. Now, after fifty-eight years, it has reached its twenty-eighth edition and runs to 950 pages.

MEMORIES—CEYLON—1863-69

In Ceylon the report of Mr. Smart, Chief Engineer of the Madras Railway, in favour of my route and

estimate had changed the tone of the papers. My plans were sent to England, and in 1863 a contract for the completion of the railway was given to a



SENSATION Rock.

"It was a sheer precipice of 200 ft. where they hung on to my heels."

contractor of large Indian experience. I was then invited by the Government of Ceylon to be Chief Engineer, and so returned with my family to the

country which but a short time previously we thought we had left for ever. At the outset there were considerable difficulties to be faced, for example :—

One portion of the heavy work on the incline was termed the "Sensation Rock" as expressing the feelings of those who went round it for the first time. The railway there had a curve of 660 feet radius and below it was a sheer fall of several hundred feet. During construction I wanted to examine a part of the rock to see whether underpinning was necessary, so the contractor and my chief assistant, each grasping one of my ankles, lowered me, head downwards, over the edge of it.

The contract time was originally four years but, in consideration of the excessive sickness which prevailed in the malarious portions of the line, one of which was called "the valley of the shadow of death," the contractor was granted an extension of eight months, and also an increase on his estimate for contingencies, which amounted to £58,000. This increase had been granted on my recommendation and I was greatly amused, at the next monthly certificate, when I disputed a sum of £2 on a culvert by the contractor saying : "I tell you what it is, Mr. Molesworth, you are doing your best to ruin me."

Notwithstanding this increase the railway was completed within my estimate of £1,500,000 ; the total cost, fully stocked, including all past expenditure under the Company amounting to £1,436,127.

On the completion of the railway, Sir Hercules Robinson, the Governor (afterwards Lord Rosmead), offered me the posts of Director-General of Railways, and Director of Public Works, with the promise of a seat in the Legislative Council at the next vacancy. As Director-General I found the task of organising the railway in a new country no easy matter. The clerks, porters, signalmen, guards, station-masters, and others were necessarily new to the work. Even the European drivers and brakemen were unaccustomed to work so steep and long a gradient, and landslips during the monsoon impeded the traffic. But difficulties were finally overcome and the traffic soon settled down to steady working.

Another problem was the keeping of the peace between Heads of Departments. I was amused when the Governor told me the Traffic Manager had complained to him that in disputed questions my decision was invariably given against him and in favour of the Locomotive Superintendent ; and that the Locomotive Superintendent had complained that my decisions always favoured the Traffic Manager ;

also as Director of Public Works I came in for a legacy of quarrels left me by my predecessor. Disputes arising between himself and the Revenue Officers, or the Government Agents of the Colony, were naturally shared by his officers, such quarrels wasted too much time and I declined to enter into them. Instead of resenting any offensive letters from the Revenue Officers I endeavoured to answer them by explaining matters with calmness and courtesy.

On one particular occasion, when a Government Agent wrote : " It is all of a piece of what continually happens in your Department," I replied : " If you will look back to your letter of —— you will find that the fault lies with you. I will take no action on your letter by handing it up to the Government until I hear from you again as you may perhaps wish to withdraw it." I got a letter back again : " My dear Molesworth, you are quite right and I am extremely obliged to you." Another man who started a passage of arms, said : " I hope you didn't notice the tone of my letter ? " Reply : " I never read your letter but simply my Head Clerk's abstract of it, and the tone entirely escaped me." The result of this plan was that the disputes entirely ceased and I became friends with the members of what was formerly considered the rival Service.

When the railway was so far finished as to enable trains to run about thirty miles from Colombo, the future King of the Belgians, then Duc de Brabant, was coming down from Kandy, and the Lt.-Governor asked me to bring him down from the temporary terminus by railway. I drove the train myself and there being no turn-table at the temporary terminus I was obliged to run it tender first. . . . When on a steep gradient and sharp curve I saw, to my horror, that the natives had placed a number of large stones on the rail. . . . There was no time to stop, so I threw open the regulator and dashed full speed at the obstacles which, to my great relief, were scattered in all directions without derailing the train. My alarm was heightened by the fact that not only the Duc de Brabant but also all our principal Government officials were among the passengers. Of course the train was in all the more danger from having to go tender first with no life guards, the latter being always in front of the engine. It was an anxious moment and I *did* feel hot! This incident was suppressed at the time as it might have been magnified into an attempt on the life of the future King of the Belgians! I met him again many years later when at the International Monetary Conference at Brussels in 1892, and General Strachey, my fellow



OUR RECEPTION OF THE DUC DE BRABANT AT THE TEMPORARY TERMINUS OF THE RAILWAY.

delegate for India, told him I had saved his life in Ceylon, but I said : " Nothing of the sort. I merely dashed at the things and put on full steam to save my own life as well as your Majesty's." He was much interested in the story of his narrow escape.

The policy I urged on Government, as Director-General of Railways, was the avoidance of that inflation of capital which has been the bane of English railways. They took this advice, the capital account of the main line from Colombo to Kandy was closed with the happiest results ; the railway not only paying off its capital expenditure, but ultimately yielding a revenue of twelve per cent. on the first cost.

As Director of Public Works I had much interesting work in restoring ancient irrigation ruins which, owing to changes of dynasty, internecine wars, etc., had lapsed into dense depopulated jungle. Several of these gigantic works were restored by me ; but shortly after my departure to India Sir Hercules Robinson, who had taken great interest in irrigation, was succeeded by other Governors and the interest waned. That branch of the Service was neglected ; roads needed for the development of the irrigated districts were not made, and even the small budgets voted for irrigation were not spent.

Galle was at that time the port of call for Ceylon

and, whilst arranging for the removal of rocks at the bottom of the harbour, I realised the error of a belief then prevalent among engineers, that wave action was harmless at depths exceeding twelve or thirteen feet, being knocked over by a ground swell when at a depth of forty feet below the surface in diving dress.

In 1869 a project for a break-water was referred to me for report. It was designed by Sir Andrew Clarke, the Admiralty Director of Works, on the assumption that the waves of the south-west monsoon always entered the harbour in a southerly direction, and this was supported by the observations of masters of vessels at anchor within the harbour.

A careful study of the configuration of the harbour, as marked by the soundings on the chart, convinced me that even though the swell outside the harbour might come from a south-westerly quarter, the natural tendency of the ground swell to lap round towards shoal water would alter the direction of the waves to a southerly direction at the anchorage and thus mislead observers there. Having communicated these views to the Governor a series of observations were taken by the Master-Intendant of the Port which entirely confirmed my surmise, and I was able to prove conclusively that the proposed breakwater would not afford the slightest protection to ships in the harbour. The project was therefore abandoned.

As the maintenance of the roads in the Colony formed by far the largest item in the Public Works budget, I found it necessary to put that work on an entirely new footing, with the result that, before I left Ceylon, a saving of £35,000 a year had been effected and the roads were kept in better repair, although there had been a considerable addition to their mileage.

"I am inclined to think the most valuable service I rendered the Colony was obtaining for it a decimal currency. At first everyone was opposed to me from the Governor downwards, who wrote that he had "carefully considered the question and the difficulties were insuperable."

It was only after a fight of five years that I carried my point. I formed myself into a Decimal Association with the aid of the editor of the *Ceylon Times*, and by degrees brought round the public and the Governor. The latter, in 1869, asked me to re-submit my proposals.

In 1870 I was deputed by the Governor to confer with the Treasury Officials in London. In 1871 my scheme was sanctioned by the Home Government, and the new copper tokens were minted in Calcutta in accordance with it and from my designs. The change was effected without the slightest difficulty, and, after a short trial, it was hailed as a boon even

by those who had bitterly opposed it. And I had the satisfaction of receiving many letters to this effect.

Ceylon did not escape the "Gauge Craze." Whilst I was on furlough in England the Governor wrote to me that he had decided that there should be a break of gauge in the projected extension of the railway. I replied, strongly protesting against such a policy, and urged that at all events before arriving at a final decision, comparative estimates should be made of the total cost of extension on both the 5 ft. 6 in. and the 3 ft. 6 in. gauges to ascertain whether the saving would justify the break of gauge.

This was done, and the Governor wrote to me : "I have completely adopted your view that a break of gauge would be a great mistake."

MEMORIES—LETTER FROM SIR CHARLES GREGORY—**1869.**

In November, 1869, I received the following unexpected letter :—

1, Delahay Street,

Westminster.

November 19th, 1869.

MY DEAR SIR,

I have been requested to recommend to the Government of India, two or three gentlemen qualified to hold the appointment of consulting

engineer in India for the *Railway Department*: from which three, the Government would select one who would have to act under Colonel Strachey, R.E., the head officer of the Public Works Department. My report has not yet gone in, but I propose to mention your name as one whom I think eminently qualified for the place, both personally and professionally. The place requires personal tact and powers of organisation, which you so specially possess.

Some engineers wouldn't choose to work under a Royal Engineer as a Head of the Department, but I don't think you would object to that. One reason why I feel you would be suited for the position is because from past experience I know you would be perfectly faithful to an official superior.

I have spoken to Julyan and Sargeant about you: they say that if the India Office make inquiries from them they will give you their warm support, although they shall be greatly distressed to lose you from Ceylon. So in mentioning your name I shall advise the Indian people to make inquiries of the Crown Agents.

Whoever is appointed will, I think, have a good chance of distinguishing himself. I don't like to use any arguments to persuade you, but it would

be a great satisfaction to me to see in such a position one with whom I have worked so pleasantly for some years. As I said, my letter has not gone in, for the Member of the Indian Council who called on me *re* the subject on behalf of the Secretary of State is out of town, so nothing will be known of my views in India at any rate before next mail, and perhaps not then. The India Office may choose another of my nominees, notwithstanding the very strong way in which my knowledge of you will enable me to speak of you, and so you may hear nothing of the matter.

Meanwhile, think the thing over so as to be able to give an answer if you are asked a question, and let me know by return what your rough ideas are?

If you wish to confer with the Governor or Colonial Secretary I don't see any objection to your doing so.

I shall advise that Colonel Strachey be recommended to write to you direct as to whether you would take the place if offered.

So there is something for you to think about this Christmas!

With best wishes of the season.

I am,

Yours very truly,

CHARLES HUTTON GREGORY.

Before anything further could be settled I returned on furlough to England ; and whilst there completed *Spiders' Spinnings* in 1870. The hero of the book, Raneo, was drawn from life in our garden at Larkhall Rise. It used to be a great delight to my eldest boy when he was about three years old, to get me to bring a garden spider and let it run over his hand, and he was in my mind's eye when writing *Spiders' Spinnings*. I wrote most of the work before I went out to Ceylon in 1859, but did not complete it till on my return to England in 1870. Then I took it to Routledge, who paid me £10 for the copyright. After reading the manuscript he remarked that the poetry in it was " pretty good—for a spider ! " I spent the proceeds of this work in buying a microscope.

" SPIDERS' SPINNINGS "

The following is a review of *Spiders' Spinnings* in the *Atheneum*, December 24th, 1870. After reviewing *Waifs and Strays of Natural History* by Mrs. Alfred Gatty the reviewer goes on to say that " a far abler and more diverting book for children who prefer scientific treatises to fairy tales is G. L. M.'s *Spider's Spinnings or Adventures in Insect Land*. It is a tale for the young, and is an unusually humorous

performance that vindicates the poor spider against the charges too harshly preferred against him by certain popular naturalists, and aims at correcting the thoughtlessness which is the cause of the greater part of the cruelties perpetrated by boys and girls on the inferior animals.

"It was Gosse who inveighed against the long-legged dusky creatures in the following strain of vehement dislike : 'The common consent of mankind regards most of these creatures (spiders) with revulsion and abhorrence . . . as bloodthirsty and vindictive, treacherous and cruel even to their own kind ; bold and prompt in warfare, ever vigilant, full of stratagem and artifice ; highly venomous, lurking in darkness, endowed with curious instincts, and furnished with many accessory means for the capture and destruction of other animals.'

"With much regret, and something of shame, we acknowledge to having hitherto participated in Gosse's antagonism to the creatures, who have at last found a convincing advocate of their claims to human sympathy and admiration ; but now that we have read the history of the gentle Raneo and the loving Arachne, and learnt how closely their species resembles mankind in intellectual and moral qualities, we shall never see a spider without soliciting him to

make his home under our coat-sleeves or at the nape of our necks."

MEMORIES—FESTINIOG RAILWAY—1870-71

In 1870, during my furlough, Sir George Chesney offered me a post at Cooper's Hill, then just started. But though much tempted to remain in England as I now had a large family rapidly growing up, I declined owing to one important fact, namely, that tuition was not in my line and I could not have carried out the work satisfactorily to myself.

In 1870 a series of plausible but misleading articles in *The Times* ascribed fictitious advantages to an exceptionally narrow gauge. The statistics of the Festiniog Railway, previously a two-feet gauge horse tramway running from a group of slate quarries to the port, were compared with those of English railways of standard gauge, showing that the former was earning $29\frac{1}{2}$ per cent., and claiming that this result was due to the gauge.

At the request of the Secretary of State for the Colonies I visited the Festiniog Railway, and was fortunately able to prevent a serious mistake being perpetrated in one of our Colonies by exposing the fallacy that had been put forward on behalf of the two-foot gauge. I found that the nominal expendi-

ture on the Festiniog Railway by no means represented the actual cost ; that at least £50,000 should have been added to it, for converting the tramway into a railway, and providing it with rolling stock. Moreover the comparisons that had been made with railways of the standard gauge were untenable, the conditions of traffic on the Festiniog Railway being altogether exceptional ; and if the ordinary mineral rates prevailing on other railways had been charged there would have been a deficit instead of a dividend.

About this time I had occasion to visit the Baldwin Locomotive Works in America, where I found young Bright, one of the Rochdale Bright family, hot in argument concerning the merits of Free Trade.

He appealed to me in support of his views, but like Balaam I declined to bless him. In those days it was fearful heresy for any Englishman to advocate Protection.

CHAPTER IV

MEMORIES—THE GAUGE QUESTION—INDIA—1871-88

THERE is every reason to believe that my known antagonism to break of gauge caused a postponement of my appointment to India, pending a settlement of that question. For immediately after my arrival Lord Mayo, the Viceroy, sent for me and said : “I wish you to distinctly understand that the question of the gauge of railways has been settled, and *must not be re-opened.*” In 1873, however, under the Viceroyalty of Lord Northbrook, the gauge question *was* re-opened. Lord Roberts (then Colonel and Quarter-Master-General) raised a strong protest against the break of gauge on the frontier railways, and drew a graphic picture of the confusion that would occur if the troops and munitions of war were brought up more rapidly than they could be pushed forward.

Six years later, during the Afghan War, General Kennedy complained to the Government that the railways were not forwarding military troops and stores to the front with sufficient dispatch, and I was



S.M.L.A.

ordered to go to Jhelum to see what could be done. On my arrival there I found Lord Robert's picture more than realised. An enormous area was crowded with military stores, carts, baggage and war material of every description piled one on another in the utmost confusion, which was being increased by the arrival of sixteen trains a day. Owing to break of gauge the block at Jhelum was such that the Commissariat Officer told me it would be a relief if the railway service were suspended for a month, as he could not in that time send off the existing accumulation by carts to the front.

The completion of the railway from Jhelum to Pindi was urgently needed to relieve this block, and I was instructed to arrange on the spot for pushing on its construction as an emergent work, *carte blanche* being given to me as to funds, while the details were left to my discretion.

Happily the protest of Lord Roberts led to a complete change of policy with regard to the frontier railways. The Punjab-Northern Railway, the construction of which was originally commenced on the standard 5 ft. 6 in. gauge, and then altered to the metre gauge, had again to be changed to the standard, and during the change the temporary lines of the two gauges were working side by side. Altogether the

change of policy involved the alteration of more than 1,000 miles of railway.

STATE RAILWAYS

At the outset there were difficulties in the organisation of State railways which made comparison with Guaranteed railways untenable. The guarantee railways had occupied the main trade routes of India, and had developed their traffic ; consequently they were in a position to work with greater economy than the State railways, which required time to settle into efficient working order.

Men of the class required for railways could not be obtained in India, and those imported from England were new to the country, the language and the work. The guaranteed railways had few men to spare, and those mostly "hard bargains." Moreover the mileage completed for traffic in a short time was unprecedented ; in one year 1,100 miles of new State railways were opened, consequently as soon as the staff of one State railway approached efficiency, some of its members had to be drawn off to take part in the working of newer lines. Many were opened under pressure, in an unfinished state. At the end of my first year of office, there were nineteen State railways, or a total length of two thousand eight

hundred miles in progress or proposed, exclusive of trial and alternative surveys.

I had always urged on the Government of India that railways should be made for the development of the trade of the country rather than for revenue, That the lowest possible rates should be adopted, and that the capital account should be closed when practicable. On the guaranteed railways no such policy was in force.

Notwithstanding all obstacles, the State railways were worked economically and satisfactorily—the management rapidly improved, and a large number of officers were in training for employment on further extensions. The greatest difficulty with which we had to contend was the mischievous interference of the Secretary of State for India with the Government of India, and the consequent want of anything like a fixed policy.

With every change of ministry, under political party influence, questions of management, control, and gauge were re-opened. During the first ten years of my tenure of office, State railways passed through the following phases :—1st, Local Government ; 2nd, the Supreme Government ; 3rd, a Director ; 4th, five Directors ; 5th, a Director-General.

MEMORIES—INDIA IN THE SEVENTIES—MESMERIC
INFLUENCE

Dr. Esdaile had been in charge of a hospital in Calcutta, where he had performed extraordinary operations under mesmeric influence on patients who in ordinary circumstances would have died under the operation. These were witnessed by a large number of medical men who signed their names as having been present at the operations. In those days chloroform was scarcely used. Having been much interested in reading Dr. Esdaile's book on Mesmerism, I had shortly afterwards been travelling with Colonel Lindsay over a malarious district in Northern Bengal, and on arriving at Calcutta we stayed at the United Service Club.

While there my servant was laid up with a bad attack of fever. One morning he came to me, quite blue, and said in a pitiful voice that he wanted "Aram" (rest). I told him to lie down at full length and shut his eyes, and then proceeded to carry out the instructions given in Dr. Esdaile's book for therapeutic cure. I continued to make the passes for nearly an hour, when, being thoroughly exhausted, I left him asleep on the floor and went to my work at the Secretariat. Returning in the evening I found

him up and about, quite brisk, and there was no return of fever.

On another occasion, when staying with one of my engineers, a young assistant was brought down from his station on the Hulkar Railway to the Bungalow in which I was staying, suffering from sunstroke and in an almost unconscious state. There was no surgeon in the district, but the native apothecary said he would send in some leeches to be applied. Having always heard that cases of sunstroke needed stimulus and not weakening, I asked the patient : "Would you mind if I tried to better your condition by mesmerism ?" "No, I don't mind," he said in a languid tone. I told him to close his eyes. He was lying at full length on the sofa, and I made the usual passes and as I did so felt a sensation in my finger-tips like that of "brush discharge in vitreous electricity," and his eyeballs quivered beneath his closed eyelids. After a time I asked him how he felt ? He said the pain had gone from one side. I then did the other side ; after this he said the pain had quite gone. That afternoon he rode home, twenty-two miles.

In after years, when meeting him again, I asked him if he had had any return of sunstroke. He told me, "No, I don't think I have." Then I asked if he

remembered my mesmerising him and he said, " Oh yes, but it wasn't that."

PAGETT, M.P.

As a rule I remained with the Government at Simla from March to October, making my tours of inspection during the cold weather, occasionally rejoining the Supreme Government at Calcutta. It was on one of these journeys that I came across the original of Rudyard Kipling's " Pagett, M.P.," the type of a mischievous class with whom India is afflicted ; Members of Parliament who come out to India for a few weeks in the cold season with prejudiced minds, to stir up disaffection, to decry the administration of the State, to slander its officials and then to return and pose as authorities on Indian questions.

The " Pagett, M.P." of Kipling is supposed to have been persuaded by a Government official to remain in India long enough to grasp the difficulties and realities of Indian life, with the result that he who came out to scoff, left a wiser and a sadder man.

The official who saw him off thus describes the end :—

" And I laughed as I drove from the Station
But the smile died out on my lips,
As I thought of the fools like Pagett
Who write of their Eastern trips ;

And the sneers of the travelled idiots
 Who duly misgovern the land,
 And I prayed the Lord to deliver
 Another one into my hand."

The " Pagett " I met was an insufferable cad, who disgusted me greatly by speaking ill of those whose generous hospitality he had enjoyed.

Owing to my long and intimate connection with the Government of India, I am able to assert without fear of contradiction that it is the most able and pure administration in the world ; that it contrasts favourably with our British Parliamentary system, which too often subordinates the welfare of the country to a vote-catching policy, sacrificing sound principles to party exigencies.

Lord Curzon has said with regard to Indian officials : " You will find a sense of responsibility, a devotion to duty, of love for the country and sympathy with its people, developed to a degree that is without parallel in the history of any other country."

MEMORIES—INDIA—MY POOR RELATIONS

When at Simla I was in the habit of climbing to the top of Jakko, a mountain of about 2,000 ft. high, before breakfast with gram in my pocket for the monkeys who the fakir used to feed at the top. He



A DEDICATION FROM MY PAST RELATIONS

would call "Aao ! A——o !" and far away in the jungle below there would arise little moans and cries, and monkeys came up from all parts.

The fakir had names for them all : there was the Rajah, the Vizier, Kamdar (giver of work), etc., and the wives of the Rajah were called Ranees.

One morning I was giving one of these wives some gram when the Rajah stepped before her to prevent her having any. As he became very angry and threatened me with open mouth I threw some gram in his face, at which he turned on me more threateningly. I then threw more gram sharply in his face, whereupon he turned upon a little monkey near and gave him such a thrashing that the poor little brute ran howling down the khud side of the mountain.

The fakir told me that I was believed to be a brother of Juggernaut owing to my connection with the locomotives, which were thought to be a species of the Juggernaut Car.

The Cat worship in India seemed to me one of the forms of idolatry most to be tolerated, though in this Lord Roberts did not agree with me. I remember an occasion when he lunched at my house, and; knowing his dislike to cats, we had taken particular care that he should not be annoyed by having any in the room but as lunch proceeded he

became visibly uneasy. Further search was made with the result that a kitten was found curled up under some rugs. He had *felt* her presence !



HARVINGTON, Sir Guilford Molesworth's home at Simla.

MEMORIES—INDIA—AFGHAN WAR—1879

Many of the frontier railways involved very heavy work ; notably the Jhelum-Pindi Railway, which passes through very broken country ; the Sind-Peshin Railway and the Kojak Pass, in which there is a tunnel, two and a half miles in length, and the curves and gradients are severe.

The Afghan War threw much work on my hands.

The Sohan Bridge being the key to the opening of the line to the Front, work was carried on day and night with the aid of electric light. Violent floods might at any time be expected to wash away the staging ; but the urgency was such that I determined to risk a girder of 150 ft. span ; and my son, who was in charge of the work, erected it with such dispatch that it was safe from danger twenty-eight hours after the first portion of the girder had been risked.

On the western frontier railway communication was pushed on, also as an emergent work, by the construction of a line across the desert, from Jacobabad to the foot of the mountain range ; and the railway, 133 miles in length, was constructed telescopically, at an average rate of more than a mile and a half per day, one section of fourteen miles having been constructed at the average rate of two and a half miles a day.

In 1879 I was ordered to prospect for a railway, *via* the Khyber Pass to Jellalabad ; and had nearly accomplished my task when the Sherpur disaster occurred. I was in a tent with General Bright at Jellalabad when he received a telegram from General Roberts, asking him to send on reinforcements which he could ill spare, as he had not sufficient men to secure his communications. I had arranged with



THE SOHAN BRIDGE UNDER CONSTRUCTION

the General to let me have the next day a couple of hundred Carabineers, to ride with me through a dangerous pass, which I wanted to examine ; but after the receipt of Roberts' telegram the General refused to allow me to continue my reconnaissance ; in fact he threatened to arrest me if I persisted in going on, and the Government telegraphed to me to return.

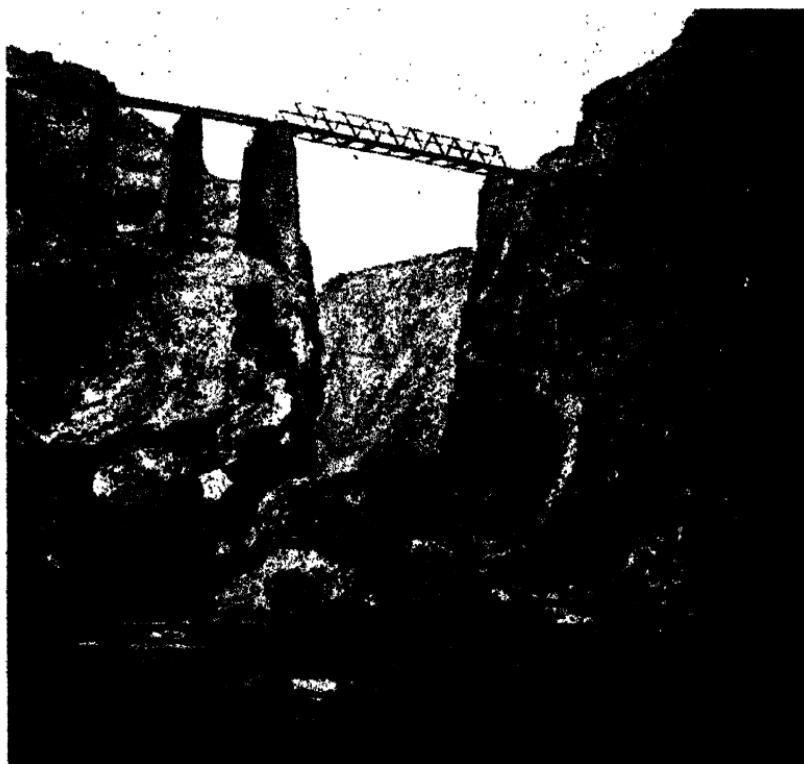
In March 1880 I was instructed to make a reconnaissance for a railway through the mountain range to Kandahar. The country beyond the frontier was then in a very disturbed state. Capt. Showers and his escort were killed at the Chappar Rift two days after I had been there.

The Chappar Rift was about two miles in length, filled with huge blocks of rock.

Colonel Lindsay and I had to pass through this and to leap from rock to rock with the greatest difficulty and the small escort which accompanied us could not keep up—we were entirely in the hands of a group of men under Fiza Khan—who two days after cut up the entire party of Captain Showers.

After the Afghan War Colonel Lindsay asked Fiza Khan why they did not cut us off in the Chappar Rift and make us share the fate of Captain Showers, but he answered, " We were not quite ready."

A soldier of my escort was cut down by a Ghazi, and a survey camp which I had just left was attacked and several of the survey party killed. The com-



CHAPPAR RIFT.

It was up this ridge that Colonel Lindsay and I had such a narrow escape.

munications between Chaman and Kandahar were very scantily guarded by merely a small dépôt at every tenth mile, held by a handful of native soldiers,

commanded by Major Wadby, the Road Commandant, who was shortly afterwards killed at one of these depôts, after a gallant defence against overwhelming odds. I had to ride in one day from Chaman to Kandahar, about eighty miles, with a couple of native soldiers as my escort. Kandahar



CHAPPAR BRIDGE.
View from the other side.

swarmed with Ghazis, and a Sikh soldier was murdered by one of them at the gate of the city, just after I had passed through it. When I went to dine with General Sir Donald Stewart, he thought it necessary for my safety that a soldier with fixed

bayonet should precede me, and another follow me. Sir Donald had made arrangements for me to accompany him on his expedition from Kandahar to Cabul to relieve Roberts ; but the Government wanted me to examine the Bolan Pass, and telegraphed to me to return by that way. Shortly afterwards the 66th Regiment, which I had overtaken on my way to Kandahar, was badly cut up, and our troops were shut up in Kandahar, until relieved by Sir Frederick Roberts, who made a forced march from Cabul and defeated the enemy.

After Sir George White had returned to Simla, he told me that he was glad to see that the military authorities had favourably criticised the march to Kandahar ; but I remarked that nearly all our battles in India had been won in defiance of all rules of strategy—that Napoleon had said : “ The English are too stupid to know when they are beaten ; ” and I thought it was a pity to teach Tommy Atkins to know when he was beaten. Sir George replied : “ I quite agree with you. I was working round the Argandab Valley with my Highlanders at the battle of Kandahar, when one of my sergeants came up to me and said : ‘ It won’t do to go on, sir, we are being outflanked.’ I told him to ‘ mind his own business and obey orders.’ ”

The construction of the lower portion of the Kandahar Railway had been interrupted by the disturbed state of the country; but, as soon as matters had settled down, after the victory of Kandahar, I urged the Government to resume operations upon it. I wrote—

“ From my personal observation of the district during a disturbed time, I am convinced that the force required to keep order need not be large, provided that Government will observe a firm and determined policy. If, on the other hand, the policy should be vacillating, it is impossible to foresee what the railway may cost. It is much to be regretted that operations on the Kandahar Railway have been stopped, for the time will surely come, sooner or later, when this railway will be urgently required, and it is not a work that can be pushed rapidly. When the need of it is felt, it will probably be too late to construct it in time to be of any use; and I earnestly would urge the desirability of going on steadily with some of the heavy works, such as the Babeh Kutch tunnel, the Kochali tunnel, and the Chappar Rift.”

The Home Government, however, being under a policy of “scuttle,” opposed this, and my prediction was fulfilled; for subsequent events again rendered

it necessary to push on the construction at an enormously increased cost.

Some time afterwards, in reply to an inconvenient question that had been raised in the House of Commons, a Member of the Cabinet replied :—

“ The wicked Liberal Government has not been guilty of the crime attributed to it by the virtuous Conservative Party. They have not pulled up the rails of the Kandahar Railway for the simple reason that no rails have ever been laid down.”

This was absolutely untrue, I had myself seen the rails laid, and on another visit I had seen the place from which the rails had been taken. The lie, however, served its purpose in silencing the Opposition for a time.

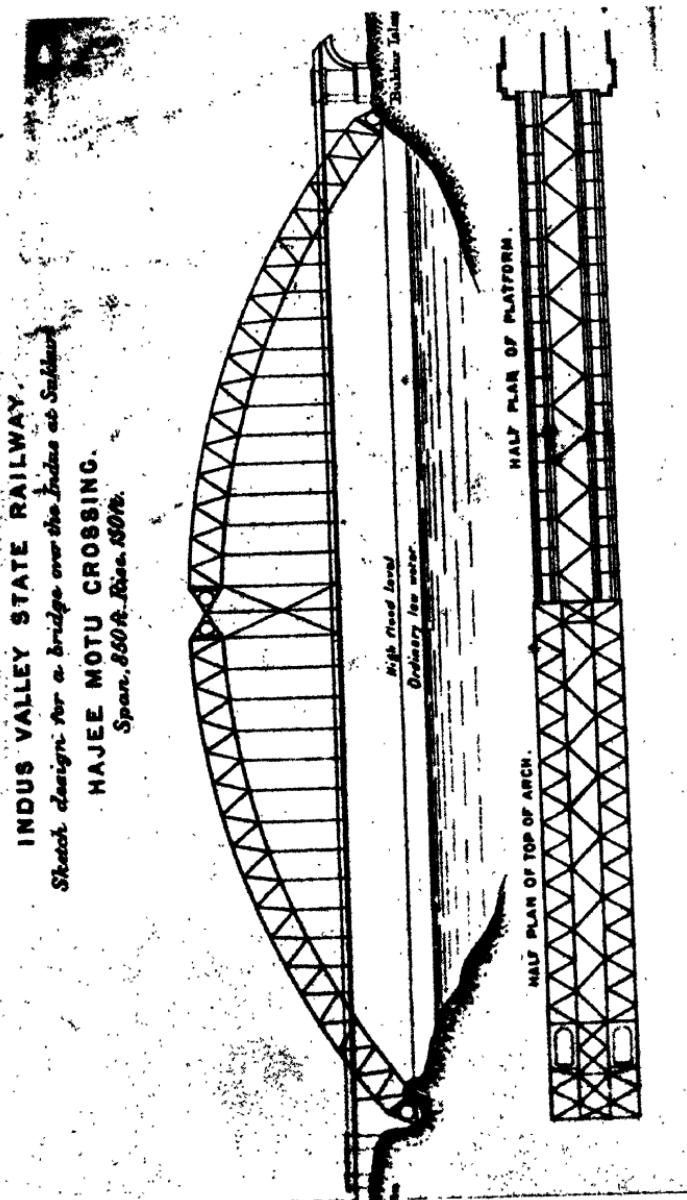
MEMORIES—INDIA IN THE EIGHTIES

Lord Lawrence, in 1869, had drawn attention to the evils inseparable from the policy of constructing railways in India with guaranteed capital, and advocated the policy of constructing and working railways by the agency of the State.

In 1881 Lord Ripon came out with instructions from Lord Hartington to revert to the policy of “ private enterprise,” so-called, which in India means no enterprise at all.

The folly of this change was exposed by the officers of the Public Works Secretariat. I pointed out to the Government of India the difficulty of discovering the grounds on which it was sought to reverse the eminently successful policy of Lord Lawrence.

The Accountant-General, in a forcible minute, urged that in no single respect is less efficiency likely to be ensured, under direct Government control, than under Joint Stock Companies, having a Board in London ; that State railways had succeeded beyond all expectation, notwithstanding frequent changes of policy (in fact, they had never had fair play) ; that, under the proposed reversal of policy, the State was to part with its profitable lines to private speculators when they had begun to show a profit, keeping the unprofitable railways in its own hands ; thereby carefully guarding the speculators, at the expense of the State, from any possible loss, whether due to their own negligence or not. He further pointed out that the State had borne the burden of bringing the Rajputana railway to its present valuable condition, and he showed by figures that its concession to a company was equivalent to a gift of half a million sterling, taken from the pockets of the Indian ratepayer, and sent out of the country. He also pointed out that Government suffered an



annual loss owing to the lines under guarantee not having been carried out by State agency; while in addition to this, the State would have to bear a further loss of about £27,000,000 to private enterprise, when the time arrived for purchasing the several guaranteed lines. It might have been expected that Lord Ripon, on the receipt of such strong expressions from responsible officers of high standing would have appointed a Commission to enquire into the question; but he simply minuted upon them "This may be allowed to drop quietly. R."

[It should be born in mind that the English railways have always been run on a totally different footing from those of India.—ED.]

THE RIVERS OF INDIA

The rivers of India present some very difficult engineering problems. Their vast size, their formidable powers of erosion, their silt-bearing capacities, and their habits of wandering, render them very difficult of management. The river Indus had to be bridged in two places at Attock, where the river was subject to a ninety-foot flood, with five spans of 300 ft. The frequency of earthquakes in the district necessitated the use of braced steel

structures instead of masonry for piers of great height ; and fan-staging was used to avoid danger from sudden floods during the erection of the girders. For crossing the Indus in the second place at Sukkur I designed a braced steel arch of 830 ft.



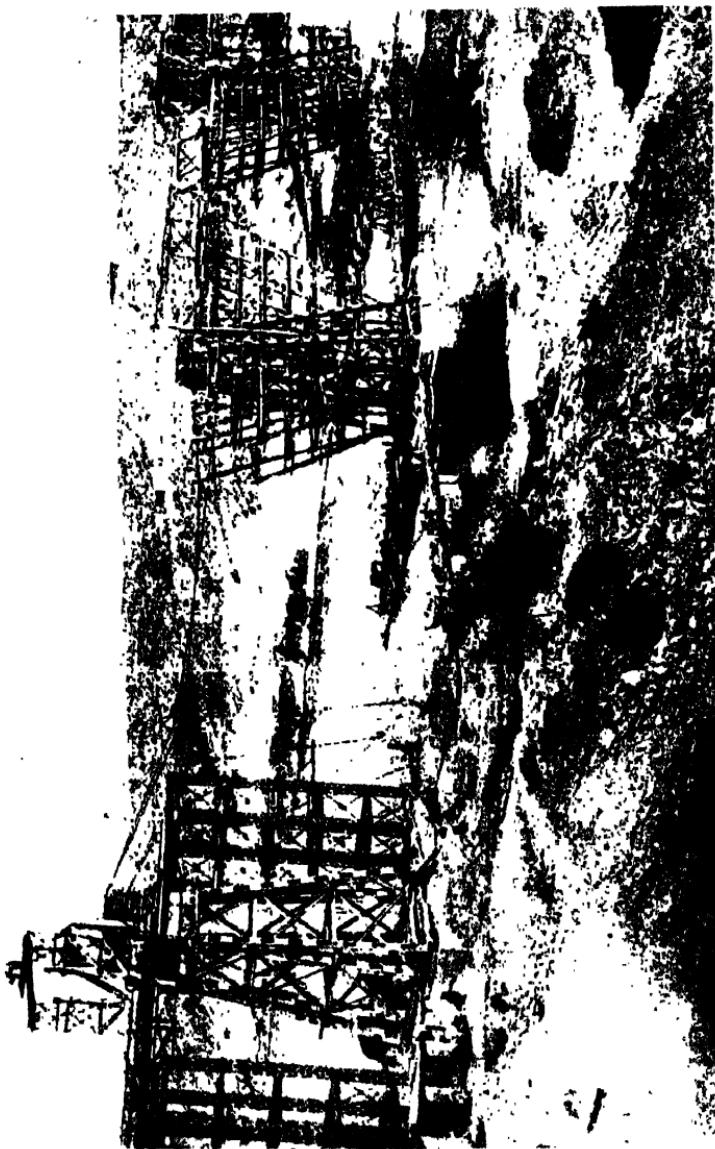
FAN STAGING ATTOCK BRIDGE OVER THE INDUS.

span, with a rise of 150 ft. It would have been the most economical bridge for that particular position, if a double roadway, as well as a line of railway, had been needed. It was not, however, built on my design, because it was decided that a roadway was not wanted and my plan required the



double width in order to secure sufficient lateral strength; so a bridge designed by Sir Alexander Rendel on the cantilever principle was adopted, and this gave sufficient lateral strength with a single line. Afterwards, however, Sir Alexander's partner, Mr. Robertson, admitted that owing to the difficulties experienced in its erection it had been a mistake in his opinion not to have adopted the arch.

On the Punjab Northern State Railway in its 108 miles there are three bridges, the aggregate lengths of which exceed three miles. The piers of these bridges are founded on wells, sunk 60 or 70 ft. below the bed of the river, and protected from scour by masses of loose stone. In some of these rivers it is not uncommon to find a channel 20 or 30 ft. deep, where there had been a sandbank twenty-four hours previously. The engineer in charge of the construction of a large bridge over the Sutlej reported the existence of "floating sandbanks" which moved at the rate of about 100 ft. a day; but a study of the sketch that accompanied his report convinced me that it was not a floating, but an ordinary sandbank, the upstream nose of which was cut away by the rapid current which, being super-saturated with silt, deposited it in the still water that

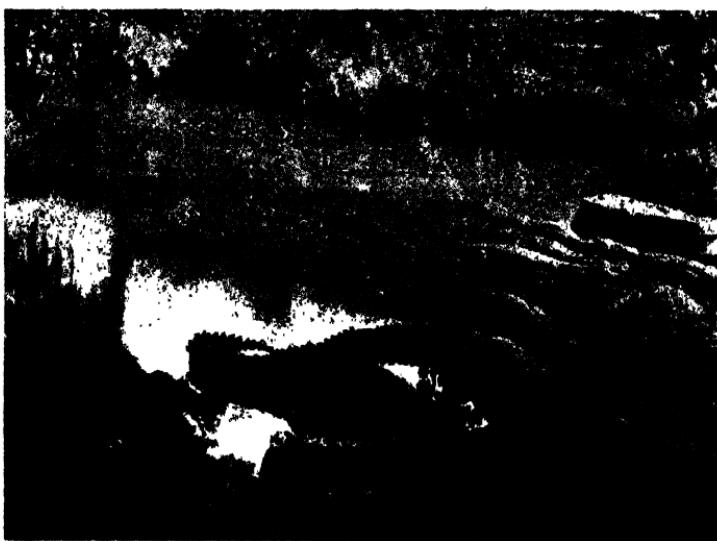


FAX-STAGING. ATTOK. BRIDGE OVER THE INDUS.

eddied in the rear of the bank. I suggested therefore that a flag should be planted on the bank, and its bearings taken from the shore. As I anticipated, the flag remained stationary, whilst the bank seemingly moved on.

The tendency of some of these rivers to wander is due to the fact that they occupy the highest ground ; for when they spill beyond their banks, the excess of silt in suspension is deposited, and the further the spill travels away from the bank the less silt is deposited. In process of time the river is raised so far above the surrounding country that it may at any time break away and cut for itself a new course, miles away from its former bed. The mouth of the river Indus, for example, is now about 100 miles distant from its former outlet. Jacobabad is about 40 ft. below the level of the Indus, and although forty miles distant, it was, a few years ago, in danger of being washed away by a flood that breached the river bank. A river near Nowshera lies so high above the adjacent country that, in order to cross it, the railway runs up to it with a gradient of 1 in 100 for about a mile ; and, after crossing it with four spans of 40 ft., it descends with a gradient of similar length and inclination. The Kosi river which flows from the Himalayas, has a straggling bed,

about seven miles in width. At the junction of the Brahmaputra with the Ganges, the Goalundo Station, the terminus of the Eastern Bengal Railway, was threatened with destruction by the erosion of the river bank, and a large spur formed of concrete blocks was thrown out to protect the station. This huge



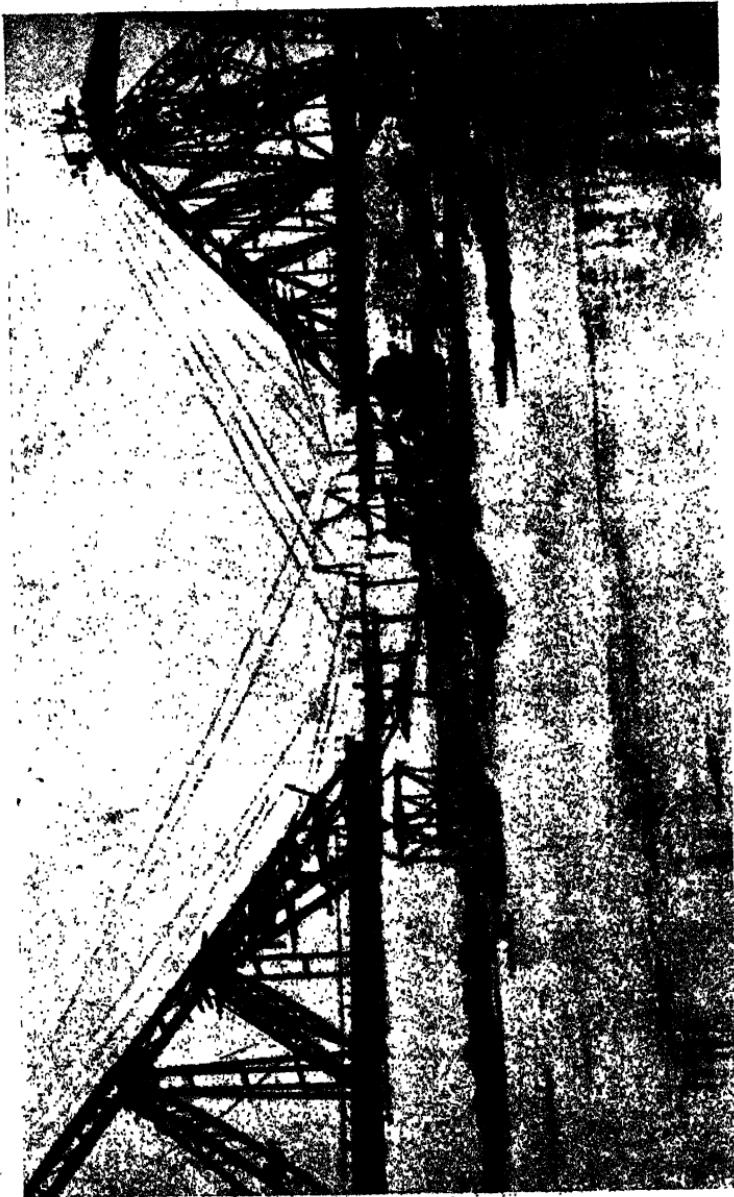
COMPANIONS OF THE BATH.

The sandbanks of these rivers swarm with Muggers or man-eating Crocodiles and Gahryals fish-eaters. I took the photograph on this page at Pir-Mugger, where these reptiles are considered sacred.

mass originally on the south or right bank of the Ganges was, when I last saw it, on dry land more than a mile to the north of the left bank of the river, a silent witness to the erosive power of Indian rivers

and their tendency to wander. The spur itself had stood well, but the river rapidly eroded its banks, cutting away several hundred feet in the course of a few days, until it formed a channel in the rear of the spur, which then hastened the destruction of the station by intensifying the current between itself and the shore. Goalundo was not then on a State Railway, but, as a member of a committee appointed to consider the difficulty, I was for the first time officially associated with Sir Bradford Leslie, who stands out pre-eminently as the most able Railway Engineer India has ever known. It is due to him to state that his connection with the E. B. Railway had ceased before the construction of the Goalundo spur was undertaken, and that neither he nor Mr. Ernest Benedict, who succeeded him, was responsible for its adoption.

In dealing with such rivers, it is impossible to lay down any hard-and-fast rule ; each river must be a study in itself. In some cases it is possible at once to construct permanent training works ; whilst in others temporary training works must be undertaken, and further operations have to be based on their results. In some instances again the course of the river has to be regulated a long way above the proposed bridge. When once a river has been



CANTILEVER BRIDGE OVER THE INDUS IN COURSE OF ERECTION.

properly trained and contracted into a deep channel through a bridge, its tendency to wander is less than when the bed is shallow and the channels numerous ; but it is dangerous to push the policy of contraction too far, especially in rivers the beds of which are raised. In South India, where the river beds are of coarser material, they require a different treatment, and shallow foundations, with continuous flooring, are used in preference to deep foundations.

MADRAS

In 1882, the Madras Harbour Works had suffered much damage from a cyclone, and I was directed to visit and report upon them. The harbour, which had previously been an open roadstead, was enclosed by a double row of 27-ton concrete blocks, sloped and built as walls without bond, and founded on a rubble base of laterite and schistose gneiss. The side walls of the breakwater 3,000 ft. apart ran out at right-angles to the shore for about 3,000 ft., then turning with an elbow, formed sea faces at an angle of 105 degrees with the sides, leaving an entrance 500 ft. in width to seaward. A careful investigation of the foundations of the breakwater which I made in a diving dress, confirmed the view I had formed from my experience in Galle harbour of the fallacy

of the prevalent belief that waves were innocuous at from 12 to 15 ft. below water, for, though the sides of the breakwater were uninjured, the blocks at the elbows had been under-scoured at a depth of $23\frac{1}{2}$ ft. and had fallen outwards. The faces did not suffer from under-scour, but from impact of the waves. In several instances, the outer, or sea row of blocks stood, whilst those on the inner, or harbour side, had fallen. This may have been due to several causes : to the percussive action communicated by the front to the rear block ; to the compression of air in the joints from the blows of the waves ; to the dragging action of the waves, in washing over the wall ; to the partial vacuum formed by the wave passing behind the wall, or to a combination of two or more of these causes.

THE ROYAL ENGINEERS OF INDIA

In 1883 an unsuccessful attempt was made in certain quarters to get rid of me under the age-limit rule (55) which inspired the following amusing skit in Rudyard Kipling's Departmental Ditties :—

“ Now Exeter Battleby Tring had laboured from
boyhood to old

On the lines of the east and the west, and eke of
the north and the south.

Many lines had he built and surveyed ; important
the posts that he held,
And the Lords of the Iron Horse were dumb
whenever he opened his mouth."

The ditty goes on to infer that " the little tin gods," i.e., Royal Engineers, thought it were better that he was laid on the shelf until they built him a berth for himself special and well paid and exempt from the law of 55. " So Exeter Battleby Tring consented his claims to forego and died on four thousand a month in the ninetieth year of his age." But as a matter of fact the Indian Royal Engineers invariably treated me with the utmost consideration although I was an interloper in their hitherto close preserves. They impressed me as a rule as a valuable body of practical engineers far more so, in fact, than their professional brethren in England ; and their friendly attitude to myself was most encouraging.

BURMA

In 1885, Thebaw, King of Burma, executed a treaty with France, tending to forestall British influence ; and our Government, disgusted with his cruelty and insolence, determined to depose him, and occupy the country. A force was therefore despatched by

the Irrawady River, then the only means of communication with Mandalay. Operations however did not cease with the capture of Mandalay ; and I was ordered to make a reconnaissance for a railway from Rangoon through Tonghoo, to the capital. Col. Mark Bell, R.E., and I, were the first Europeans to march right through from Tonghoo to Mandalay ; although a small force had previously penetrated as far as Yemethen, about 160 miles from Mandalay, and was there when I reached it. Up to that point my escort had consisted of half a dozen useless Madras Infantry soldiers, who hampered my movements by their inability to keep up with me, the journey having to be made on foot ; but when I reached Yemethen, the General considered it unsafe for me to proceed with so small an escort ; especially as five villages had been attacked and burned in the vicinity of that place, through one of which I had passed a few hours previously, having outstripped my escort. The General, therefore, gave me fifty men of the Somerset Light Infantry—splendid fellows—forming a great contrast to the Madrassees, and I marched with them to Mandalay. I had no difficulty in getting them to keep up with me. Sometimes when I suggested that my projected day's march might be too far for them, they replied :

"Oh, no, Sir. If it were ten miles further we would do it." In fact, it was known that there was beer at Kiouksai, about twelve miles from Mandalay, and they hadn't tasted beer for months. The first thing I did when I reached Kiouksai was to go and order their beer.

At Mandalay, Sir Frederick—the late Lord—Roberts kindly arranged and accompanied me in a gunboat reconnaissance of the river Ava, landing at the site I had proposed to bridge the river, where we were met by a squadron of Native Cavalry, and rode back to Mandalay. Returning to Rangoon by the Irrawaddy, in the Government steamer with Sir Charles Bernard, we stuck on a sandbank, and were taken off by a small gunboat that patrolled the river, in which a lieutenant, a doctor and a number of blue-jackets were packed like sardines in a tin. The lieutenant told me that they had been living this life for more than six weeks, and the men enjoyed it immensely. He also told me that dacoits had been in the habit of waylaying and robbing native boats on their way down the river; so he put a few blue-jackets into a native boat, and when the dacoits boarded it they met with a warm reception, which surprised them.

After the close of the war I received the thanks

of Her Majesty the Queen for services rendered, and both the Afghan and Burma War medals were awarded to me.

INDIAN VICEROYS

During my term of service India had been ruled by five different Viceroys :—

Lord Mayo, whose popularity was mainly owing to his genial personality and racy Irish humour. He was assassinated during a visit to the Andaman Islands.

Lord Northbrook, who succeeded him, was somewhat chary of taking responsibility upon his shoulders and was scarcely strong enough to rule India. Socially he was amiable and courteous, but shy and nervous.

Lord Lytton was a very able Viceroy, but somewhat Bohemian. He left India, on the advent of the Liberal party to power, before he could carry out fully much of the able policy which he had initiated. During his Viceroyalty, the Empire of India was proclaimed at Delhi.

Lord Ripon was a weak and at the same time an obstinate Viceroy. He was primarily responsible for the unrest from which India has since suffered ; by stirring up race discord, and by attempting,

THE VICEROY'S VISIT TO THE INDIAN GOVT.
GROUP AT THE RESIDENCY, BANGALORE.



reading from left to right:-
SPRINT ROW:- A.D.C.; MR. "HORNTON"; -G.R. -Vice-Admrt
Gellor; -Colonel Williers; -Sir George Colley; -Sir Charles Bernard;
MR. CLOKE; -Mr Coke; -Dr. Bennett; LOWER ROW:- Sir James Gordon; -
Mr. Minotie; -Sir Gullford Wolseworth; -Major Lee; -Sir Owen Sykes;
LORD LYTTON; -Sir Scott Moncrieff; -Mr. Saunders; -Sir Chas. Elliot; -Captain
Stansforth.

prematurely, to push forward native officials into positions which they were unfitted to fill, either by heredity, surroundings or education. With every desire to bring forward native officers, I have always found it, in practice, unwise to promote them to the more responsible posts. It has almost invariably proved unfair to the Government, and injurious to the individual so promoted. I have known good native officers who have done well in less responsible positions, ruined by promotion.

Lord Dufferin was by far the most able and greatest statesman of the period. The quiet, unobtrusive tact with which he smoothed down the difficult legacy of unrest bequeathed to him by Lord Ripon, has never been sufficiently recognized or appreciated. Of Lord Lansdowne I saw but little; for I resigned my appointment shortly after his arrival.

FAMINES.

Two famines occurred in India during my time. In Bengal I had to visit the Tirhoot district, to make arrangements for bringing in grain, and pushing on railway communication. But this famine was only partial, for at Chhattisgarh, "the granary of India," rice was rotting in the fields for want of means of transport. This district, however, has since been

opened by a railway. The Mysore famine was much more serious, and I had to accompany Lord Lytton, the Viceroy, to the famine district. In



FAMINE GROUP, MYSORE, 1877.

one portion of it 130 per cent. of the population was under famine relief; but whether the surplus

population was due to exaggerated returns, or whether the people of neighbouring districts were attracted by free food, it is difficult to say. Most of those under relief were in a distressing condition, most literally all skin and bone. The doctors told me that it was almost impossible to get them to come in to the relief camps until their case had become hopeless, and all that could be done for them was to alleviate their sufferings. One of the Revenue Officers devised a plan of using cactus leaves, divested of thorns, as food for saving the lives of cattle ; but the head villager, to whom he carefully explained the process, said : " Very good ! but who is going to take so much trouble ? " I witnessed a similar example of native helplessness in Ceylon ; where Sir Hercules Robinson had imported and distributed to native headmen Carolina rice ; this yields two crops, whereas the native rice yields only one in the year ; but the headman whom Sir Hercules questioned said : " This rice no good for this country, always in crop, no time for anything."

RESIGNATION—1888

In 1888, being sixty years of age, I resigned my Indian appointment. The last work on which I

was engaged being a reconnaissance for the East Coast Railway. I had, for some time past, pressed on the Government the need of developing, by railway communications, the trade of Eastern India, which had been greatly retarded for want of means



"THE WISE MEN OF THE EAST."

"The Wise Men of the East" is a portrait taken just across the Kistna. I sometimes had three or four camps out at a time, perhaps 12 or 15 miles apart, to examine the best route. In this way a reconnaissance was made of the best part of Rajputana. The last thing I did going up the East Coast Railway was to recommend the Kistna Bridge.

of transport. There were no ports between Calcutta and the most southerly point of India at which goods could be shipped or unloaded during the monsoon.

At Masulipatam, for instance, steamers had to anchor five miles from the shore. The only difficulties to be encountered on this line were at the crossings of the great rivers, the Kistna, the Godavari, the Mahanadi and the Rupnarain. The railway was constructed shortly after I left. The Kistna Bridge, consisting of twelve spans of 300 ft. girders, carried on piers 50 ft. high, founded on double octagonal wells, was carried out under the superintendence of Mr., afterwards Sir Francis Spring.

During my term of office nearly 4,000 miles of State railways were sanctioned, and 3,450 opened for traffic. For many years the railway policy of India had to struggle against the adverse influence of those short-sighted critics who denounced it as plunging the country into debt and inevitable ruin. There can be no doubt that at the outset the interest on the capital required for railways put a heavy strain on the resources of India ; but, since they have developed, they have brought in a large revenue to the Government. To use the words of Lord Curzon :

“ We have now secured the whole of our Indian railways and canals for nothing, and, instead of their costing us money, they have become a steady source of income to the State.”



BRIDGE OVER THE KISTNA RIVER, MADRAS. After completion.

INDIA—1871-88

[*The following are recollections of Sir Guilford in India nearly fifty years ago.—ED.*]

I wish I could tell you of the delight that his presence gave us both whenever we met him in India or at home. The fresh interest he took in everything, his simple ways, I mean absence of every thought of himself, and his courtesy just endeared him to every one who knew him.

When I first met him we were in camp that winter in very queer, wild, hilly country between Jhelum and Rawulpindi. My brother was surveying a line there and Sir Guilford had come to inspect the work. . . . I had made, in his honour, some pastry for a fruit tart which turned out anything but a masterpiece. None of Harry's staff who were with us, could get through one helping, but Sir Guilford cheerfully ate all his and asked for a second! Of course, to show he appreciated my efforts and to prevent my youthful worrying over giving him a bad dinner.

At the end of the visit he took my brother off to Attock on some further work there, and I was to be left alone in the Camp—but just as they were starting he proposed that I should come too. There was,

unhappily, only one dak gharry for him and my brother and one for another high official, a solemn being who was to be of the party too. Sir Guilford at once solved the knotty question by suggesting that he and I should ride on the top of his (there was only room for one inside) which we accordingly did, much to the shocked surprise of the solemn person, for it was like riding on the top of a cab !

Sir Guilford was always the youngest and most energetic of every party when there were inspections of surveys going on, soon out-distancing all other walkers.

H. and F. GEOGHEGAN.

CHAPTER V

MEMORIES—AVIATION—1889

IN 1889, after my return to England, we went to live at the Manor House, Bexley ; and it was about that time that Mr., since Sir Hiram Maxim, a very early pioneer in the field of practical aviation, invited me to inspect an aeroplane that he had built. It was a masterpiece of ingenuity and mechanical skill, for which he had devised a steam engine marvellously light for the power it developed. I had always contended that aviation would not be practicable until a lighter motive power than the steam engine could be discovered. Petrol, combined with the internal combustion engine, has rendered it possible ; but, compared with the flight of birds, aeroplanes are clumsy contrivances, and much remains to be accomplished. I have studied the flight of eagles in the Himalaya Mountains, and have watched them rising from more than 1,000 ft. below me in an enclosed valley where there was not a breath of air, circling round to a great height above me without any perceptible wing movement. I

have also watched seabirds of the albatross or petrel genus in the North Pacific flying round our steamer, which was travelling at twelve knots an hour against a strong head wind. The birds would fly three or four hundred yards ahead of our vessel and then as far again astern, without any visible motion of the wings, except a slight balancing movement, in changing direction. Many theories have been advanced to account for these phenomena, but they have all been miserably insufficient. I asked Lord Kelvin if he could explain them, but he replied : " That which puzzled Solomon puzzles me also."

(*Prov.* xxx, 19.)

MEMORIES--DIRECTORSHIP

Soon after my retirement to England I was offered a Directorship on a certain company and accepted it, but when they sent me one hundred fully paid-up shares, telling me it was the usual thing to send that amount for every Director's acceptance, I replied that I could not countenance such a practice, and begged to resign my Directorship. This gave me so little faith in public companies generally that I refused all other offers except that of the Calcutta Electric Supply Corporation, the working of which had been known to me from its commencement, also

the other Directors were old Indian friends in whom I had confidence.

SOUTH METROPOLITAN GAS COMPANY—1890

In 1890 I was interested in Sir George Livesey's great work for co-partnership and in reply to my expression of sympathy he sent me the following letter :—

South Metropolitan Gas Company,
709A, Old Kent Road, S.E.
February 5th, 1890.

Sir Guilford Molesworth,

Dear Sir,

I thank you heartily for your kind letter and for the pamphlet which I have read with much interest.

You are perfectly right in your conclusion that the interest of the union and not that of the workmen, is the paramount object of the men who assume the lead in these movements, while the rank and file are subject to a tyranny that far exceeds anything that an employer could exercise towards his men.

In fact, a man of my acquaintance who had been connected with a trade union of skilled workers for many years, made the remark in reference to these new unions and their tyranny



THE MANOR HOUSE, BEXLEY.



THE MANSION HOUSE IN WINTER.

that, in comparison, the employers are not in it, for the worst employers could never attempt anything so extravagant. This man told me that our profit-sharing proposal was what he had been longing and hoping for these last twenty years.

Yours very truly,

GEORGE LIVESEY.

The adoption of co-partnership, which gave the workmen a share in the profits of the Company, caused a strike, although the Strike Committee of the Gas Workers' Union admitted that it would be beneficial to the workmen, they considered it was "a seductive, though most plausible bribe, calculated to weaken the influence of the Union." They therefore issued two thousand strike notices to their members.

But those who were wise enough to revolt against this tyranny, expressed their entire confidence in the scheme, "believing it to be a wise arrangement for the mutual benefit of the employer and employed, which will tend to prevent such unhappy occasions as the present strike, which entails so much misery and bad feeling."

The scheme has been an entire success. In the twenty-fourth year of its operation the bonus earned

by the members (the first year had been £6,863) had increased to £48,000, and 5,900 employees were holding the Company's stock to the value of £370,000.

When attending the funeral of Sir George Livesey in 1908 I was struck with the number of workers, who attended in their thousands, thus testifying their appreciation of his character and the great benefits he had gained for them.

FROM AUTOBIOGRAPHICAL NOTES—UGANDA RAILWAY
—1891

In 1891 I was asked to advise the Imperial British East Africa Company on the best means for connecting the East Coast of Africa with the shores of the Victoria Nyanza by means of a railway. The problem was difficult, as I had never been in the country, which was little known and was then in a state of savagery. It was only possible to pass through it with a large number of armed followers. Two years previously an expedition under Jackson and Gedge, with 51 soldiers and 480 followers, had passed through the district without serious fighting ; but it was followed by a German expedition under Dr. Karl Peters, who in a wanton manner slaughtered a large number of the Masai, and stirred up their hostility to Europeans.

Information could only be gleaned from books of travel, and from such scanty data as could be deduced from maps that had been compiled, partly from travellers' observations, partly from native reports to missionaries, and partly from conjecture ; however, a careful study of the configuration of the country, as indicated on the map by the trend of the rivers, enabled me to suggest a route for preliminary reconnaissance, which appeared to give the best chance of obtaining a practicable line of railway to the Lake ; and I suggested that a barometrical reconnaissance should be made on that line. In order to reach the shore of the Lake it was necessary to cross a huge volcanic rift about twenty miles wide and 2,000 ft. deep, stretching from north to south throughout British territory ; and moreover, beyond the rift an elevation of between 8,000 and 9,000 ft. above sea level had to be surmounted in order to reach the Lake.

The Lords of the Treasury then asked me for a report on the organisation and cost of such a reconnaissance as I had suggested. In this I stated that it would not be prudent to estimate the cost at less than £20,000. The actual cost of the expedition under Capt. Macdonald, R.E., amounted to £19,710 —a pretty close approximation to my figures.

Macdonald reported that the route he recommended for adoption was practically that suggested by me, "the main point of difference being that the valley of the Nzoya River was followed down to the Lake, instead of that of the Nyando River." This change would have added about one hundred miles to the length of the railway; but when the construction staff, under Mr. Whitehouse, began to make the detailed survey, it was found that the line I had suggested by the Nyando Valley was quite practicable and the railway was constructed on that route.

PRIZE ESSAY ON " SILVER AND GOLD THE MONEY
OF THE WORLD "

In January, 1891, I gained a prize for my essay on "Silver and Gold." The adjudicators being Sir William Houldsworth, Professor Foxwell, and Morton Frewen.

This prize (£50) I gave to the Bi-metallic League, as I wished to be quite independent, it not having been my practice to write for money; in fact, when an honorarium has been sent me for any particular article I have returned it on the principle of not expressing my opinions *re* Social or Economic problems for gain.

MEMORIES—MONETARY CONFERENCE AT BRUSSELS
1892, NOVEMBER 22ND—DECEMBER 13TH

In 1892 I attended the Brussels Monetary Conference as Delegate of the Government of India; but all the work done for this Conference was rendered practically useless, and the delegates, sent thither by their respective European Powers, made their journeys in vain.

This was owing to the attitude taken at the outset by Sir Rivers Wilson, Delegate for Great Britain, who stated that his Government as a Government, "could not admit that the maintenance of our existing monetary system should be brought into question, or that the presence of British Delegates at a Conference where Bi-metallism was discussed should lead to the supposition that England would be ready to examine the possibility of change in her monetary system."

I suggested that if Sir Rivers Wilson listened to the Conference, before making up his mind, he might follow the example of his two eminent predecessors: Mr. Gibbs, late Governor of the Bank of England, and Mr. Goschen, late Chancellor of the Exchequer, who were at the Conference of 1878. After which, Mr. Gibbs made the following statement at a public

meeting : "Mr. Goschen and I were together on the Conference in Paris. Both of us were sturdy defenders of gold mono-metallism, but I have changed my mind. I do not say Mr. Goschen has changed his mind but he has modified it." Mr. Goschen said : "There is a class of Mono-metallists who say that Bi-metallism is all nonsense, and that they cannot understand what it means. Now I do not think it all nonsense. I think it a serious demand for a change which, if adopted, would produce large results."

As I was leaving after this protest the Spanish Delegate said to me, "That's rank rebellion." "No!" I replied, "only the Indian Mutiny. But remember that as Delegate for India I represent a population of three hundred millions, whereas the Delegate for England only represents a paltry forty or fifty millions!" My opinion is that if that Conference had adopted the system of bi-metallism, it would have saved us the scarcity of metallic money in this war, 1919.

SIAM, 1893-97—THE BANGKOK KORAT RAILWAY

In 1893 Mr. Murray Campbell, an entire stranger to myself, telegraphed to his agents in England to invite me to act as Arbitrator in matters of difference

between the Royal Railway Department of Siam (staffed by German Engineers) and himself, in connection with his contract for the construction of the Bangkok Korat Railway.

I accepted the post on the understanding that we were to act in a judicial capacity and not as partisans or advocates of either party. Herr Lange, Chief Councillor to the German Ministry of Public Works, was the Arbitrator appointed by the Siamese Government.

On the 20th February, 1894, Herr Lange and I met at the Cannon Street Hotel in London, when Mr. Campbell conducted his own case, and Herr Rohns, then the Chief Engineer of the R.R.D., represented such department, Mr. Verney being present to watch the case on behalf of the Siamese Legation.

We sat at the Cannon Street Hotel for fifteen days, and on the 3rd of March published our award, which was favourable to the Contractor.

In 1896 further causes of dispute necessitated our meeting again, and visiting Siam. At that time I had absolute confidence in Herr Lange, feeling it impossible to believe that a gentleman holding his honourable position would depart from his judicial capacity, or have any communication behind my back with either of the parties concerned in dispute.

Whilst in Siam we inspected the railway together, and sat hearing evidence for sixteen days (November 19th to December 17th). The Royal Railway Department being represented by the Director-General, Herr Bethge, the legal adviser of the Siamese Government, Monsieur Rolin Jacquemins, with the assistance of the Chief Engineer, Herr Gehrts.

The Arbitration was again resumed in London on the 15th March, 1897, where Mr. Murray Campbell continued to conduct his own case with the assistance of his solicitor, Mr. Leighton ; and at the conclusion the Arbitrators were addressed by Mr. C. Cripps, Q.C., M.P. (afterwards Sir Charles Cripps), on his behalf ; the R.R.D. being represented by Mr. Phipson Beale, Q.C., and the Chief Engineer Herr Gehrts. The sittings in London occupied twenty-two days.

During the first portion of the Arbitration in London I had proposed that in the event of disagreement between us, the Umpire should be the President or Vice-President, past or present, of the Institution of Civil Engineers, leaving the selection in the hands of Herr Lange.

He acquiesced at the time, but as there was unanimity in our first and second awards the necessity did not then arise.

Subsequently Herr Lange urged the necessity of appointing an Umpire which should be neither of English nor German nationality, suggesting a Dutch Engineer. I gave preference to an English Engineer because as a rule he was thoroughly conversant with the working of the Arbitration Act. But on Herr Lange's pressing the question I proposed Herr Seccama, Counsellor to the late King of Holland, who had had experience in tropical countries.

Herr Lange proposed others as more suitable, amongst them Herr van Bosse, who had also had experience in tropical countries, and, having at that time confidence in Herr Lange, I consented to his acting.

Directly the Contractor saw his name he sent his agent to Herr Lange and myself to protest against the appointment on the ground that Herr van Bosse was a personal friend of Herr Bethge, the Director-General, and that he had reason to believe that the matters in dispute had already been discussed between the officials of the R.R.D. and Herr van Bosse. I felt very strongly that we ought not to appoint an Umpire against whose appointment either party protested; but Herr Lange as strongly took up the position that we were already committed, and considering myself bound by the agree-

ment I informed the Contractor that his protest could not be entertained.

It is necessary to explain here that up to this point Herr Lange had been in accord with me and that I had no idea there was likely to be a difference of opinion.

I was first placed on my guard by an incident which occurred during the sittings at the Cannon Street Hotel, when desiring to confer with Herr Lange and entering his room a few moments before the sitting of the Court, I was surprised to find him closeted not only with Herr Max Am Ende (a German Engineer who had been consulted by the Siamese Government concerning one of the most important matters in dispute) but also with Herr Gehrts, the Chief Engineer of the Siamese R.R.D. who at the time was actually representing the R.R.D. before the Arbitrators and assisting to conduct the case.

At the conclusion of the sittings at the Cannon Street Hotel, Herr Lange differed most essentially from me upon the most vital points in dispute. The difference of opinion came upon me with considerable surprise, but we decided to send for Herr van Bosse, and we agreed between us (this is confirmed by a letter signed by Herr Lange and myself) that neither

of us should discuss the case with the Umpire except in the presence of the other.

Notwithstanding this agreement, when I reached the Cannon Street Hotel on the day of Herr van Bosse's arrival, I found him already with Herr Lange, who was in the act of explaining the case with a section of the line spread out before him.

The third circumstance which caused me uneasiness was the admission contained in Herr Lange's letter (April 27th) to the Contractor's Solicitors that after my return to England, he, Herr Lange, had made a second inspection of the railway works behind my back, and in company with the officials of the R.R.D.

I was astounded at receiving this information, and that Herr Lange had kept his second visit to the line secret from me. His reply, when charged by the Solicitors with having taken this step, in conjunction with the other matters, combined to shake my confidence in his sense of justice.

Up to this time, although greatly dissatisfied, I had felt my official position had precluded me from communicating with the contractor, but now came to the conclusion that if any further irregularities came to my notice, or if the interests of the contractor were likely to suffer through what had

occurred, it would be my duty to make him aware of what I knew.

Our last meeting as Arbitrators was in Holland, where Herr van Bosse, as Umpire, sat with Herr Lange and myself and where, owing to his refusal to accept much of my evidence, it became clear to me that he had adopted the rôle of partisan instead of Umpire.

He went out of his way to make suggestions to the prejudice of the Contractor, many of which were entirely unsupported by the evidence, and which had never been put forward on behalf of the R.R.D. by its advocates. It then became clear to me that, without hearing the evidence, Herr van Bosse had already made up his mind against the Contractor. Accordingly, on the evening of the 4th of June, 1897, I informed Mr. Murray Campbell of the various facts which are mentioned in my official declaration. In his reply he asked me to convey his decision to withdraw from the Court of Arbitration, at the same time repeating his strongest protest against the actions which had rendered this extreme step necessary.

There was therefore no alternative for me but to retire from the Court myself, which I accordingly did, declining all further participation in it as then constituted.

I may add my conviction from the evidence which came before me, that from the commencement the German Engineers had grudged the employment of an English Contractor and so did their utmost to ruin him.

The Foreign Office referred the matter to Sir Edward Clarke, who went into the question from a judicial point of view and subsequently gave judgment entirely in favour of the Contractor.

INSPECTION OF RAILWAY IN UGANDA, 1898

In 1898 I was requested by the Foreign Office to visit the railway in Uganda, and to report generally on the organisation, system of control, progress and other matters, but especially with regard to the difficulties of the Great Central Rift. On my arrival I found the railhead at the 170th mile. The difficulties with which the engineers had to contend at the outset were very great, many of them may be said to be peculiar to this railway. Between eighty and ninety per cent. of the labour had to be imported, chiefly from India ; a force of about 1,500 men had to be maintained in a waterless district, everything had to be carried from railhead to the advanced parties on the heads of porters, who, in addition to this load, had to carry their own food, thus greatly

limiting their radius of action. A large transport dépôt of camels, mules, donkeys and bullocks was organised, and about 1,500 native porters were enrolled. The first 250 miles were infested with the tsetse fly, which rendered that district fatal to transport animals, amongst whom the mortality was very great. "Jiggers" swarmed in the coolie camps, and numbers of men were constantly in hospital with these pests, which caused ulcers, frequently involving the amputation of one or more toes. Waves of fever were common. Of my party, the Chief Engineer and my Secretary suffered, and, at one station, I found 280 out of 320 men of a construction gang down with fever. Fortunately, it was not of a virulent type.

Progress was seriously impeded by the depredations of man-eating lions, one of which was believed to have taken twenty-eight of our coolies. An attempt was made to entice him into a trap made of rails, and baited with three policemen with rifles in a separate partition. The lion was entrapped, but the policemen, firing at random in the dark, broke the trap and the lion escaped. It was, however, afterwards shot by Mr. Patterson, the engineer in charge of the bridge at Tsavo, the day before I reached that place on my return from the rift. (A



THE UGANDA WARRIOR AT HOME.

very interesting account of the depredations of these lions has been given in Patterson's book, *The Man-eaters of Tsavo.*) Most of my journey was made on foot, or bicycle with solid tyres where footpaths admitted of their use, the thorny character of the Jungle preventing the use of pneumatic tyres.

The heavy work on a locomotive line descending into the rift, required at least a year for its completion. It was therefore decided to make a temporary rope-incline into the rift, with a maximum gradient of 1 in 2, by which materials could be carried forward so as to commence the work on the ascent of the opposite escarpment.

FRIENDS—MR. HENRY WARRINER

Mr. Henry Warriner, who has already been mentioned, is also described in the following extract from the first edition of the Pocket-Book :—

“ I cannot deny myself the satisfaction of recording my special obligations to my friend Mr. Henry Warriner: not only for many kind and useful suggestions in the revision of this book for publication . . . but for much valuable and practical information which I have derived from him in past years.”

FRIENDS—SIR CHARLES PETER LAYARD

Sir Charles Peter Layard was Government Agent (equivalent to Lieut.-Governor of an Indian Province) to the western province of Ceylon. Being continuously brought into official contact with him I admired his character greatly; he was always so straightforward and honourable. We kept up our friendship after his retirement; in fact, until the day of his death.

FRIENDS—PHILIP BRAYBROOKE

Philip Braybrooke was another fine character. He was Government Agent for Central Province of Ceylon. We had formerly been at school together so our friendship was of long standing.

FRIENDS—SIR ALEXANDER RENDAL

Our school friendship revived when we were again brought into touch by our respective appointments, he being Consulting Engineer to the Secretary of State for India (Indian Office) when I was Consulting Engineer to the Government of India for State railways.

At first there was some friction between us owing to divergent views which had to appear officially.

. . . To avoid this I suggested that any difference between us should be discussed unofficially, just between ourselves. After this everything smoothed down, our correspondence became of a most friendly character, and we ever after remained fast friends.

FRIENDS—SIR EDWARD WILLIAMS, R.E.

When I got out to India, he being then Colonel Williams, R.E., Deputy-Secretary to R.W.D., received me with very much kindness. He was a most able Secretary, and always keen at his work. Our official connection ripened into a friendship which was maintained after our retirement from India. I shall always feel grateful for the generous treatment and assistance which he gave me when new to my work in India.

FRIENDS—MR. F. T. HAGGARD

Mr. F. T. Haggard, of Broadwater Down, Tunbridge Wells, offered £100 towards the formation of a Referendum League, provided someone else would do the same. I responded to his call, and from that day forward we became firm friends. We had many points in common and maintained a correspondence. A near relative of his wrote: "Mr. Haggard's

marvellously clear brain, coupled with his childlike faith, made him rather an unusual character. He never rested, his pen was always busy, and many of the things for which he worked all his life are now becoming facts. He never thought of himself. Many a time, when I have gone into his room quietly to see if he was awake, he has been on his knees praying. I think that was the secret of his wonderful patience under his sufferings. . . . He had a fund of humour. I well remember a few days before the end. He was very ill but when the doctor arrived he was quite bright, telling some of his most amusing jokes. I remonstrated afterwards, telling him he had given the doctor no idea of how ill he was, when he said with a brilliant smile, ' Poor old M—— ! I must try and amuse him, it is so dull for him.' This was typical of his character."

[Mr. Haggard passed at the ripe age of ninety-two. Sir Guilford was with him shortly before his death, and attended his last service.—ED.]

FRIENDS—SIR CHARLES TUPPER

Our first meeting was when I spoke in support of his views at the Mansion House . . . Afterwards he came to reside at Bexley when a strong friendship arose between us.

*The whole of Tupper's political career has been characterised by his extreme modesty, his self-effacement, his devotion to the welfare of the country and generosity to political opponents. The latter trait has been remarkably displayed in his support of his opponent and rival Premier of Nova Scotia, Mr. Joseph Howe, whose selection as Secretary of State involved a bye-election. On that occasion he said :

"Should you be beaten in Hants, I will resign my seat in the Commons. . . . Cumberland will send you to Ottawa and me to Halifax. You can look after the interests of Nova Scotia in the Dominion House, I will do what I can for the old province in the local Assembly. If the election goes against you, do not think of resigning."

Sir Charles had just returned to England from a visit to Canada, where he had received a splendid ovation from all parties. He was in his ninety-second year. His mind was clear and active, and he took as keen an interest as ever in politics, especially in those of the Dominion he so ably helped to build up.

* "Sir Charles Tupper, a Great Empire Builder," by Sir Guilford Molesworth, K.C.I.E. *The Empire Review*, June 1913. (No. 149.)

FRIENDS—SIR ALFRED YARROW, BART.

Some years ago he built and endowed “View Convalescent Home” at Broadstairs, a princely gift for the benefit of the children of those who had seen better days and had fallen into straightened circumstances.

He gave it to the Institution of Civil Engineers, and I came into contact with him as one of the Committee of Management, our official connection ripening into a genuine friendship. He began life in a small way, repairing the engines of ships in the Thames, subsequently organising small workshops, ending with enormous shipbuildings, until obliged by increasing rates—caused by Socialistic extravagance—to leave the Thames for Glasgow and subsequently to Western Canada.

He is of a modest, unassuming character, looks after his people well, and is beloved by all who know him.

PRESIDENT OF THE INSTITUTION OF CIVIL ENGINEERS,
1904

[In 1904 Sir Guilford was elected President of the Institution of Civil Engineers.—ED.]

Extract from presidential speech at the annual dinner held in Merchant Taylor's Hall, 1904 :—

The President said, “ It is now sixty years since I

began to qualify for the profession of a Civil Engineer, and fifty-one years since I became a corporate member of this Institution.

" Looking back through that period, I cannot fail to be deeply struck with the immense change that has taken place in the status and prestige of the civil engineer. . . . The prefix "civil" to an engineer seemed rather absurd to the general public in those days, when the engine-driver was called the engineer, and we students of the College of Civil Engineers were called Polite Stokers by the man, or rather the boy, in the street.

" Gentlemen, the attitude of the public towards civil engineers and men of science may be gauged by the fact that an eminent leader of thought bitterly resented the intrusion of science into the seat of classical learning.

" He complained that the Oxford Doctors had 'sadly truckled to the spirit of the age in conferring the degree of D.C.L. on a hodge-podge of philosophers.' Now you will be amused to hear the names of those who composed that 'hodge-podge' — they were Brewster, Dalton and Faraday. (Laughter.)

" Well, gentlemen, things have changed since that time. When I became a corporate member of this Institution, fifty-one years ago, the number of



PRESIDENT, INST. C.E. 1904-1905.

all classes on its books was 775. It now amounts to nearly 18,000." (Cheers.)

END OF PROFESSIONAL CAREER

The year 1904 practically marks the conclusion of Sir Guilford's professional life as engineer. He has since worked at the social and economic problems of the day, subjects in which he had long been interested. Of these, his most important work *Fiscal Facts and Fallacies*, was the result of a talk with the Secretary of the Tariff Reform League, who in reply to his urging the need of a book of reference for Tariff Reformers, suggested that he should write it himself, which he accordingly did.

It was published in 1909. In 1910 a cheap, popular edition was asked for and brought out, 35,000 copies of which were sold.

The Referendum was another work (*see Opinions*). In 1913 Mr. F. T. Haggard writes to him : "I daresay you know what an interest Lord Lansdowne takes in the Referendum. . . . Do write to him and back him up. If *he* would start a Referendum League I would be a handsome subscriber."

EDITOR'S CHAPTER

1914

"A meeting of the East India Association was held at Caxton Hall, Westminster, on Monday, April 20th, 1914, at which a paper was read by Sir Guilford Molesworth, K.C.I.E., entitled 'The Battle of the Gauges in India.' Field-Marshal the Right Hon. Lord Roberts, V.C., K.G., was in the chair." (Official report.)

At the close of the lecture Lord Roberts said : "Ladies and gentlemen, we have had a very instructive lecture this afternoon, and I venture to endorse the last suggestion of the lecturer, 'That the Government of India will adopt some wise and comprehensive policy which will tend to restore, in some degree, the advantages of uniformity of gauge in the railways of India.'

"I gladly accepted Sir Guilford Molesworth's invitation to preside at this lecture, partly because we were friends in bygone days in India, but also as Sir Guilford has pointed out, the subject of the lecture was one in which I had reason to be deeply interested. . . ."

Thus two veteran friends of India met for the last time. That same year came the War and in September Lord Roberts wrote :

" Dear Sir Guilford,—Thanks for your letter. I don't think it would be any use my advocating compulsory service now. If the people cannot realise the necessity for it in our present dangerous condition I feel that nothing I could urge could possibly have any effect." Two months later Lord Roberts died at the Front.

Sir Guilford, though at the age of 86, volunteered for Home Defence and was accepted. He went through several drills, but medical opinion vetoed this before long owing to heavy marches, etc. In 1915 he volunteered to work as a skilled mechanic in Vickers' munition works at Crayford, but being told that his services would be more useful in office work, he worked in the estimating department daily from 9 a.m. to 4 p.m. for nearly five months, when the doctor again intervened and he had to give up the work. But not before he had become convinced from his own observations that the output of munitions, under trades-union influence, was not what it should be; which induced him to endeavour to arouse better feelings by writing, and printing, an appeal to

workers, reminding them how "every restriction of output and every strike during war involves the death of thousands of our brave heroes fighting to save you and yours from the horrors of invasion."

EXTRACTS FROM LETTERS, 1905 TO 1920

The following extracts from his letters may help to describe Sir Guilford's life during these last few years :—

(After returning home from a visit.)

May 12th, 1905.

The cats and dogs were all delirious with joy at our return. Jill danced about on her hind legs and expressed her joy in various ways. Kitty at once clambered up on my shoulder. . . .

Our garden is looking perfectly lovely. The horse-chestnuts and lilacs are in full bloom and everything looks so refreshingly green. We planted all our rock plants before dinner, and they look very flourishing this morning.

CORRESPONDENCE WITH MR. TREVELYAN, 1915

After reading the life of Mr. John Bright by Mr. G. M. Trevelyan, he wrote to the latter drawing attention to the fact that he, Mr. Trevelyan, had "unwittingly cast an undeserved stigma on his, Sir

Guilford's, father." This led to the following correspondence :—

(Copy.)

2, Cheyne Gardens, S.W.

February 12th, 1915.

Dear Sir,

I regret the delay in answering your letter of January 30th (now followed by that of February 11th), but I have only just returned from Serbia, where I have been in connection with the Serbian Relief Fund. I should otherwise have hastened to acknowledge your first letter.

I do not think that if you read the sentence of mine following on the quotation from Bright's diary to which you object, that I can be regarded as endorsing the diarist's words, or accusing your father of disloyalty. The only question in dispute is how far Mr. Bradshaw was misreported (surely not a matter very seriously affecting your father's honour). At worst I have only accused Mr. Bradshaw of "unwise vehemence" due to "natural resentment." I have not accused your father, or even Mr. Bradshaw, of disloyalty; I have clearly indicated the difference of my own feeling from that of the diarist. However, I will keep your letters, and if, and when, after the end

of the war there is a question of a fresh edition of the life of Bright I will certainly look up the question as you indicate, and if I think Mr. Bradshaw was misreported will alter either the text or note 2 on page 37. I should be very sorry to give you offence.

Yours very truly,

G. M. TREVELYAN.

The Manor House,
Bexley, Kent.

February 16th, 1915.

Dear Sir,

I have to thank you for your kind and courteous reply to my letter. At the same time, let me assure you that nothing has been further from my thoughts or wishes than the idea of your accusing my father of disloyalty. At the outset I said: "You have, I feel sure, unwittingly cast an undeserved stigma on my father," and I ended by saying that the calumny had been revived by your republication of it from John Bright's diary; but I had no intention of implying any blame to you for publishing it, as you did, in good faith.

Yours very truly,

GUILFORD L. MOLESWORTH.

George Macaulay Trevelyan, Esq.

2, Cheyne Gardens, S.W.

February 16th, 1915.

Dear Sir,

I thank you for your kind letter of to-day's date. I am sorry I quoted the passage from the diary as it has given you pain, but indeed I really quoted it because it amused me by its extreme violence. As a writer of biography I am quite capable of seeing the absurdities in the great men whose lives one has the honour to write. I never took the passage in the diary *au grand sérieux*. However, I admit I should have been clearer, and, besides, you raise the point about Mr. Bradshaw being mis-reported. You have my promise to make an alteration in any new edition.

Yours very truly,

G. M. TREVELYAN.

EXTRACTS FROM LETTERS, 1915

Sir Guilford then wrote a memoir of his father, Dr. Molesworth, which was written and published that same year. The following extracts refer to it :—

March 6th, 1915.

I look upon the Memoir as my contribution to a memorial of my father. You may perhaps remember that after his death, the members of the

family made a movement about some memorial to him, but no general agreement was come to about it. I was away in India at the time and it has weighed on my mind that I had done nothing. The Memoir gives me the opportunity I have wanted.

April 2nd, 1915.

I am anxious to get it (the Memoir) in hand as quickly as possible, so as to have it out before my death which, at my age, (eighty-seven), may be any day and cannot be far off.

May 6th, 1915.

Looking on it as a whole (the Memoir), I think it will be an interesting and attractive volume ; but I do not think it will be a selling one.

Bexley.

June 15th, 1915.

Please give B. the enclosed *Causes of Spiritual Detay*, which may possibly show her that the bloated employer of labour is not *always* the oppressor of the down-trodden working-man. I have marked in red the paragraphs which are applicable to her notions.

December 25th, 1915.

I have been obliged to give up my work on munitions at Vickers', in Crayford. I had an attack of illness which required the doctor, and he positively forbade my continuing there. The Manager of Vickers asked me to keep in touch with them, so now I visit the works periodically and bring away with me work that I can do at home instead of going regularly from 9 a.m. to 4 p.m. as I had previously done.

EXTRACTS FROM LETTERS, 1916

Bexley, 1916.

You asked me to define Democracy, and to make it more clear that I am not a party man.

The enclosed extract from my preface to *Democracy and War*, which I prepared some time ago, will give you my definition of Democracy, and my letter to Mr. Asquith will shew you that I am not a party man.

(ED.—*Enclosed were as follows :—*)

In order to prevent misconception it is necessary, at the outset, to define the terms “Democratic Government” and “Democracy” as used in this book. They refer to that Government which has been in power from 1906

until the outbreak of the war in 1914 and to its supporters. This so-called "Democracy" is, in no sense, *Rule by the People*, as the word would imply. In fact, *true Democracy* does not, and cannot exist ; it is impossible under present conditions. The only approach to it could be by the "Referendum" which has been adopted with success in Switzerland, in the United States, and in some of our Colonies.

In short, the so-called "Democratic Government" has practically been the arbitrary despotism of a small clique of unscrupulous persons who have intrigued themselves into the Cabinet ; but have not been elected thereto either by the people or by Parliament ; although it claims that it represents the voice of the people. This clique is dominated by a coalition of minorities, termed "Democracy."

AN OPEN LETTER

From Sir Guilford Lindsey Molesworth, K.C.I.E.
to the Rt. Hon. Herbert Asquith, M.P., P.C.,
etc., etc.

Both the great parties "Tory" and "Liberal" are practically defunct ; they have abandoned their original principles, and their

titles are obsolete and misleading. We want a reconstruction of both parties, separated by a distinct line of demarcation, with titles descriptive of their aims and policy, and ranged under the two banners of "Constitutionists" and "Revolutionists."

I appeal to you, as the leader of the so-called Liberal Party, to emancipate it from its degraded condition—to reconstruct it, and bring back its former traditions of glory, by a coalition with those who desire purity of government.

Bexley.

May 26th, 1916.

Many thanks for sending me the extract from Sir William Herschel's letter. It is too flattering. . . . I do not think you can get *The Origin of the Religions of India* in shops. It is published as part of the "Transactions of the East India Association."

(ED.—*The extract from Sir William Herschel's letter was as follows :—*)

Sir Guilford Molesworth's fine address about the "Roots of Man's Religious Instincts as shown by their Uratt Literature" is the most enlightening review of these records that I have

had the privilege of reading, all the more so for being so condensed.

I have followed Sir Guilford's career with all the pride of an Indian fellow-servant and with the enthusiasm which his splendid achievements claimed.

But this is a surprise above all, not as in kind, but as so unforeseen, and so well timed and telling. . . . One must have read Debendos' autobiography in his own tongue to appreciate the truth of Sir Guilford's insight into the beauty of such a gleam of light as has fallen on the Hindu mind of old, and which has begun to brighten in our days. . . . May 22nd, 1916.

[*The Common Origin of the Religions of India*, by Sir Guilford Molesworth, K.C.I.E. A paper read before the East India Association, 1916.]

January 9th, 1917.

I have read Sir William Herschel's *Origin of Finger Printing* with very great interest. . . . I think he deserves the thanks of the nation for the persistence with which he has carried his point, in getting it adopted in India in spite of official apathy and indifference.

June 15th, 1917.

I have been to-day to Woolwich to distribute some of my appeals there, and I heard that the strikers there had been hooted and pelted with rotten eggs by the women who did not strike but were forced into inactivity ; and the police had to be called out to protect the strikers from the just indignation of the non-strikers. My friend in the Arsenal stated that there was a strong feeling among the people of Woolwich against the strikers.

October 23rd, 1917.

I am very busy writing a small book entitled *The Curse of Socialism*. It is merely putting in a condensed form the different arguments I have used against Socialism from time to time:

EXTRACTS FROM LETTERS TO THE EDITOR, 1918

Bexley.

January 14th, 1918.

My grandson, Jamie Blair, reached Aberdeen from Petrograd last Wednesday. It is a great relief to us to hear that he has got safely out of Russia, as there is no knowing what may happen with those foolish Socialists in power. It has

given a lesson to our English Socialists, though I fear they will not profit by the experience. . . . I send to you book post my latest work, *The Curse of Socialism*.

September 24th, 1918.

I have been busy lately in preparing *Democracy and War* for the press. It was written soon after the outbreak of war, but I've been bringing it up to date and amplifying it.

November 9th, 1918.

At last I have got the long-deferred *Democracy and War* through the press and send you a copy of it.

December 4th, 1918.

I wrote to you this morning to the effect that Germany has made greater progress in shipping under Protection than Great Britain under Free Trade, but I don't think I should use that argument, as Germany has not made so great progress as might be imagined. On going into statistics I found that since Bismarck introduced his tariff policy Germany's shipping increased four times as much and Great Britain three and a half

Though Germany has increased in greater proportion than Great Britain, the increase is not large enough to base an argument on it,

December 13th, 1918.

I have received from the *American Economist* of New York, a good review of my *Curse of Socialism*. It contains the pith of the book and might be useful to those who would not care to wade through it.

Review on *The Curse of Socialism*, reprinted from the *American Economist*, November 5th, 1915.

"*The Curse of Socialism*, by Sir Guilford Molesworth, of London, England, is the title of a forcible and intensely interesting little volume, outlining the history of Socialism from Karl Marx to the Bolsheviks. The writer dwells largely on the poisonous effects of Socialism on the Labour situation in England, especially through the British Trades Unions. . . . He traces the destructive course of strikes in England, and calls attention to the gigantic loss therefrom, both to Labour and the Nation. In this connection he says :

" During the two years, 1909-10, nearly twelve and a half million days' work and pay were lost

to the workers of this country (England), through Labour disputes ; while the ten thousand slave-drivers, organisers and agitators of Unions received pay amounting to a million and a quarter dollars, paid from the pockets of the workers. The great Dock strike of 1912 cost the workers 40,000,000 dollars ; the great railway strike of 1912 cost 12,000,000 dollars ; the great miners' strike of 1912 cost 190,000,000, or a total of nearly 252,000,000 dollars in one year. But this only represents the direct loss. It excludes the injury due to dislocation, to raised prices, and to loss of trade and capital driven to other countries. . . . In England the Social Democratic Union, the Independent Labour Party, the Peace Cranks, the Conscientious Objectors, and the 'Christian' Socialists, are doing their utmost to bring on disaster similar to that which has overtaken Russia."

Of "Christian" Socialists he writes : "It is to be regretted that a large number of persons, including clergy and even some bishops, with the very best intentions and with the praiseworthy object of remedying the deplorable social evils which exist, have under the title of 'Christian Socialists' encouraged the growth of Socialism.

Such persons incur a very serious responsibility as blind leaders of the blind. . . .

"Socialism and Christianity are wholly antagonistic," says the author; and he proves it by quoting freely from the textbooks on Socialism, which are used in all Socialist communities and centres. . . . This admirable little volume brings home to the people of America the tremendous dangers confronting this country from the growth and progress of Socialism.

LADY MOLESWORTH

On February 22nd, 1918, Lady Molesworth died. Throughout her long life she was untiring in her efforts for the moral, spiritual and social welfare of those among whom she lived. But her intense dislike to anything like publicity or praise makes it difficult even now to mention her. She was one of those who would not that even her left hand knew what her right hand did.

Of her it might be truly said, as it was said of Dorcas in the days of old : "This woman was full of good works and almsdeeds which she did" (*Acts ix. 36*).



LADY MOLESWORTH.

EXTRACTS FROM LETTERS, 1919

May 25th, 1919.

I saw your friend and had four hours' talk with him, which I found very interesting. He is an intelligent man and is willing to be convinced of the fallacy of old prejudices if he finds sufficient evidence to the contrary. But whether the evidence I gave him was sufficient for that purpose or not I cannot tell; at all events there were many points on which I am in agreement with him, without in any way changing the opinions which I have promulgated in my past publications.

There was, however one prejudice which he could not shake off, namely, Class prejudice, which so long as it exists, is an obstacle to co-operation or conciliation.

I hold very strongly the view that the interests of the classes as a whole are inseparable, that the injury to the one means an injury to both, and this holds good socially as well as industrially.

1920

In February, 1920, Sir Guilford became seriously ill and it was at one time not thought possible that

he could recover. Neither did he wish to do so. He asked the doctor to give him no medicine to prolong his life, as at his great age he could not expect to recover, and that he had no fear of death. Nevertheless he did recover and it was at this time that he wrote the following to the Editor: "I am sorry my health has broken down. I had always hoped for a sudden death, to spare my family and myself the pain and trouble of a long illness. It was not to be; but I must not be ungrateful to God for the innumerable mercies that He has heaped upon me in this life, for the pleasant lands in which my life has been cast, for the many friends I have made, for all the loving members of my family who have been such an infinite source of love and pleasure to me, for the enormous benefits I have received, and for the many opportunities which have rendered my life a happy one."

He was not only restored to health but to all his former interest in social and economic problems, and worked away as indefatigably as ever. It was in reply to one of his letters that Sir George Young-husband, Governor of the Tower of London, wrote in June, 1920: "I congratulate you on the splendid age (ninety-two) you have reached unimpaired."

EXTRACTS FROM THE "OBSERVER AND DISTRICT TIMES," FRIDAY, NOVEMBER 19TH, 1920

BEXLEY WAR MEMORIAL

"Many thousands of people, representatives of all classes, assembled at Bexley on Sunday afternoon to witness the unveiling of the War Memorial.

"Sir Guilford Molesworth, as Chairman, in the course of a few words spoken in a clear, resonant voice, so that all could hear him, asked Councillor Franklin, as Chairman of the Urban District Council, to accept the deed of conveyance of the land on which the memorial was erected."

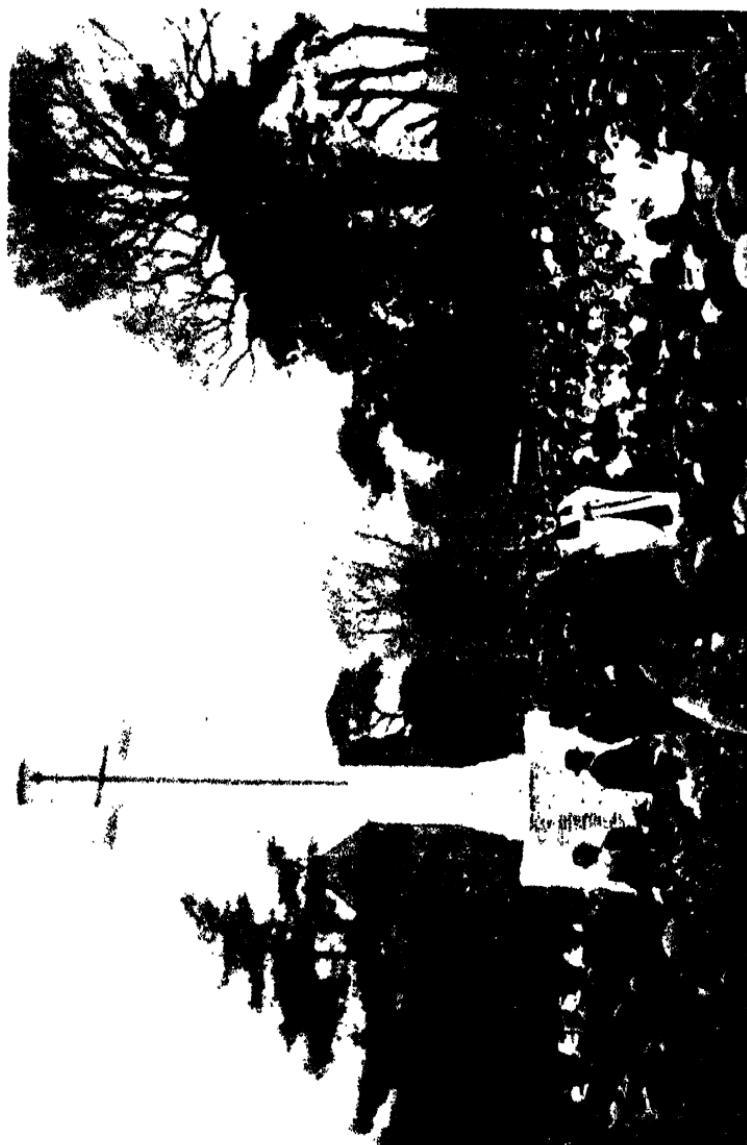
July 21st, 1921.

To a member of the Labour Party who had sent him a copy of his work, written with a view to teaching the value of character in the Socialist movement and of helping his comrades to realise that the "Christ Spirit" creates this great requirement (*viz., Socialism*) he replied:

July 21st, 1921.

Dear Sir,

I have read your work with great interest and sympathy, and the more so because in my younger days I suffered much from religious doubts and difficulties; but with a fixed determination to do that which I believed to be right, regardless of



BENLEY WAR MEMORIAL.

consequences to myself, I arrived at a satisfactory solution of my doubts, much in the way that you have arrived at yours, but with this distinction—you *saw at last that Socialism and Christianity are one*; I saw the solution in *Christ alone*. Christianity is self-supporting and needs no help.

Socialism, in its various forms and disguises, is absolutely opposed to Christianity, to industry and to fellowship. It has always failed. . . . I think that if you would study your own story carefully you would find that your numerous failures have been due to the persistent way in which you have clung to your preconceived idea of the efficiency of Socialism; which, when you have nearly arrived at the right conclusion, you have been unable to shake off.

Yours faithfully,

GUILFORD L. MOLESWORTH.

The following letter explains itself:—

28, Clifton Gardens,

Maida Vale, W.9.

August 31st, 1921.

My dear Sir Guilford Molesworth,

I am a friend of Rear-Admiral N. Iwano, I.J.N., and I have to send to you his kindest regards and

a copy of his *Shakai Shugi*, under a separate cover, which is a translation of your valuable *Curse of Socialism*, published just before my leave from Japan.

I came your country to study naval architecture as a Government scholar. To my great regret, my voyage from Japan took awfully long time, and I must leave London very soon to go to Glasgow, where I intend to stay a few months. This is the reason why I send by mail.

I beg your pardon to express here my wishes to visit you, if you accept it, when I should come back again to London.

With kindest regards, I am,

Yours sincerely,

TAKIJI HIROSE

1922

And so we leave this Nestor of the engineering profession at the age of 94 still doing his utmost for whatever he believes is for the genuine benefit of his fellowmen, and for the good of the British Empire.

Vincit amor patriæ.

CHAPTER VI

OPINIONS

“**T**HREE are two consequences in history—an intermediate one, which is at once recognised ; and one in the distance, which is not at first perceived. These consequences often contradict each other : the former are the results of our own limited wisdom ; the latter those of the wisdom that endures.” (*Chateaubriand, Memoirs.*)

Training

1. Education.
2. Work.
3. Workshop Training.
4. Engineers for India.
5. Jingoism.

India

6. Importance of India.
7. Self-government for India.
8. Religions of India.
9. State Education in India.
10. Missions and Missionaries in India.
11. General Dyer and Mr. Montague.

Economic Problems

12. Tariff Reform.
13. Protection of Home Industries.
14. Land as Property.
15. Income Tax.
16. Decimal Coinage—Currency—Bi-metallism.

Social Problems

17. Christian Socialism.
18. The "Socialism" of Kingsley and Maurice.
19. The House of Lords.
20. The House of Commons.
21. The Referendum.
22. Trade Unions and Strikes.
23. Councils of Conciliation.
24. Co-partnership.

Religious Problems

25. Personal Religion.
26. Miracles from a Scientific Point of View.
27. Eternity of Punishment.
28. Religious Unity.

On Education

Our present system is extremely defective in that it sacrifices technical to scholastic education. The

policy seems to be to cram the student with a smattering of all sorts of subjects which are too often forgotten soon after leaving school, instead of giving a good sound elementary education, and teaching him a trade. We are therefore bringing up a large portion of our population without any definite training for future employment. . . . Every man ought to learn a trade, but unfortunately the old system of apprenticeship is fast dying out, with nothing coming forward to take its place.—(Extract from Address by Sir Guilford Molesworth at Carpenter's Hall, London Wall, E.C. December 9th, 1908.)

On Work

I do not envy the man who takes no interest or pride in his work. Such a man is little better than a slave. The very essence of a happy, contented life is that it should be a busy one, devoted to matters outside self. A selfish, idle, luxurious existence brings with it weariness, disgust, and a distaste of life. . . .

I always think that the occupation of a working man is very far preferable, both as regards healthiness, and interest in his work, to that of the man who has to drudge over dull figures in a stuffy office.

Speaking from personal experience I may say my

life has been a long one, a varied one and a happy one. But no portion of it has been more happy than that in which I was working at the bench as a millwright and engine-fitter, with the struggles of life before me.—(Address to the Scholars of the Trades Training Schools. December 9th, 1908.)

• *On Workshop Training*

I recommend workshop training for all students, whether intended for the locomotive or any other department. The advantages gained by workshop experience are incalculable to the civil engineer, even though he may not in after life again be called upon to deal with engines or machinery.

The habits of precision, the thorough knowledge of the principles and practice of good work, the acquaintance with details and material, together with the fertility of resource required by actual manipulation, as well as the knowledge of men, gained by mixing with them, all combine to make such a training generally useful, irrespective of any special experience that may be gained.

Practical experience cannot be gained, as some imagine, by lounging about a workshop and watching the workmen. It must be gained in the school of life, by working with definite end and aim amongst

workmen. . . . By keeping workmen's hours and by performing tasks that have to pass the criticism of the foreman, standing the test of actual work. The course of workshop training should extend over at least two years (three would be preferable if it could be managed) and the college course should extend over two years.

Selection of Engineers for India

After my retirement to England from India I was one of a committee appointed to select engineers for the Public Works Department in India.

I suggested to my colleagues that we should be guided by the following considerations :—

That we should neglect the question of education, that being provided for in the stipulation that all applicants should have passed an examination which should qualify them to become Associates of the Institution of Civil Engineers.

That we should judge from the following points as to the fitness of the candidate :—Personal equation ; experience in surveying ; engineering ; workshop training ; athletics ; parentage ; testimonials. Great stress being laid on the personal equation as gathered from their conversation.

This plan was adopted by the committee and proved eminently successful. A Cooper's Hill man wrote from India to Sir John Otley, a member of the Commission, that they had expected the officers thus selected would have been failures, but that he was bound to confess they had all turned out remarkably well.

On one occasion we received a complaint from an eminent University professor that we had rejected one of his best men. But we replied that excellence of scholarship was not the point to be considered, that being secured by the passing of the qualifying examination, but that we had to consider six or seven other points of qualification.

I did not lay too much stress on testimonials after the following experience :

The Crown Agents of the Colonies, after advertising for a Traffic Manager to send me in Ceylon, received a highly favourable testimonial from the General Manager of one of the largest railways in England, but another candidate, appearing more suitable, was selected. . . . The Crown Agent wrote to the General Manager regretting that he had not been able to select his *protégé* because one more suitable had offered. The General Manager replied, " You are devilish lucky not to have him."

Jingoism

In the fifties, when conversing with General Espinasse, Aide-de-Camp to Napoleon III, I was struck with a remark which he made on the relative characteristics of the two nations : " Vous trouverez que les Français sont guerriers, mais pas militaires ; et que les Anglais sont militaires, mais pas guerriers."

These two terms are hardly represented by our English words " military " and " warrior." One might perhaps express the distinction by saying "The French are warlike, the English soldier-like; the French fight for glory, the English under a sense of duty."

Briefly the English characteristic may be described by the term " Jingoism," which owes its origin to some foolish lines which, however, appear to have been dictated by patriotic feeling :—

" We don't want to fight ! but, by Jingo, if we do,
We've got the ships ; we've got the men ;
We've got the money, too."

Absurd as it may seem, I hold that the coinage of this term has been a serious misfortune for England, ridicule being often a more powerful weapon than reason, but there is no occasion to be ashamed of the taunt of " Jingoism."

[Since the above was written, the following has appeared in the *Life of Disraeli* by Buckle, Vol. VI, p. 240 : “ ‘ We don’t want to fight, but, by Jingo, if we do,’ etc., however vulgar in expression, gave vent to a real political truth ; namely, that England, devoted to peace as she was, meant to make her decisions respected, and possessed the necessary material for doing so.”—ED.]

Importance of India

“ It might have been expected that every Englishman who takes an interest in any part of history would be curious to know how a handful of his countrymen, separated from their home by an immense ocean, subjugated in a few years the greatest empire in the world. Yet, unless we greatly err, this subject is to most readers not only insipid, but positively distasteful.” (Lord Macaulay.)

Some idea may be formed of the magnitude of India from the fact that it has an area almost equal to, and a population in excess of, all Europe *less* Russia. India is a vast aggregation of countries inhabited by races of various customs and religions, having no less than forty different languages in common use. She possesses enormous wealth and resources, but they are to a large extent undeveloped.

Her coalfields, so far as they have been explored, cover an area of 35,000 square miles. She has an enormous supply of iron ore. . . . But the products of India are too numerous to mention here.

There are also available in India millions of potential horse-power, in the form of water flowing from mountain ranges. The natives of India are frugal, thrifty and industrious, and skilful in work requiring delicate manipulation. Labour is cheap, and the soil in many parts fertile.

The Government of India has done its utmost to develop the industries of the country, but its efforts have been circumscribed by the intervention of the India Office under the dictation of Secretaries of State.—(From Address of Sir Guilford Lindsey Molesworth, President of the Institution of Civil Engineers, November 1st, 1904.)

On Self-Government for India

The most practical form of self-government would be by investing the Government of India with a written constitution, such as is enjoyed by the United States, by Canada, and by some of our colonies; a constitution based on principles of good government, justice and liberty, in which the rights of the people are safe-guarded, and the power of

both the Upper and Lower Chambers is restricted under the protection of a Supreme Court of Judicature, which has the right of authoritatively interpreting the Constitution, and of declaring null and void any act that may have been passed by the Chambers. The Upper Chamber would consist of the Governor-General in Council, as at present constituted, and the Lower composed of a workable number of native and British delegates, representing the various provinces in India.

A Government formed on the above lines, and with such materials, should be the most perfect government in the world.

But the scheme of hybrid democracy, which is now being forced upon India, appears to be an unworkable system of dual control which, if adopted, must end in disaster.

Religions in India

A study of these religions irresistibly leads to the conclusion that they have the same common origin, and were, in fact, originally identical. It is, therefore, a question for serious consideration whether, instead of attempting to demolish these religions, it would not be wiser to endeavour to restore them to their original purity by freeing them from those accretions

by which they have been corrupted, and to afford common ground on which the lovers of true religion might meet.

I was present at a very large meeting of the Brahmo Samaj in Calcutta, in which Keshub Chundar Sen spoke of Jesus Christ as "the greatest and truest Benefactor of mankind, who originated that mighty religious movement which scattered blessings on untold nations and generations." He added, "Blessed Jesus! Immortal Son of God! May the world appreciate Him and follow in His footsteps." Here seemed to be common ground on which Christianity might have met Hinduism.

It is unfortunate that the movement should have been partly checked through the lack of sympathy among missionaries. But there were some who took a wider view, such as the Rev. Dr. Caldwell, who in 1874 said in Congress:—

"I recognise in Hinduism a higher element—an element which I cannot but recognise as Divine, struggling with what is earthly and evil in it, and frequently overborne, though never entirely destroyed. I trace the operation of this Divine element in the religiousness, the habit of seeing God in all things and all things in God, which has formed so marked a characteristic of the people of India."

during every period of their history. I trace in it the conviction that there is a God, however erroneously His attributes may be conceived, in Whom or through Whom all things have their being. Nor need we hesitate to recognise in such ideas a Divine purpose working itself into shape."—

(“The Common Origin of the Religions of India,” by Sir Guilford Molesworth. A paper read before the East India Association.)

State Education in India

My views of State Education in India are identical with those of “the old Missionary.” He said :—

“Your State Education is producing a revolt against three principles which represent the deepest wants of human nature :—

The principle of discipline.

The principle of religion.

The principle of contentment.

“Your Government schools pride themselves in having almost done away with the rod, and in due time you will have on your hands a race of young men who have grown up without discipline. Your Government schools take credit for abstaining from religious teaching of any sort, and in due time you

will have on your hands a race of young men who have grown up in the public non-recognition of a God.

" Your Government schools spur on every clever small boy with scholarships and money allowances to a University Degree ; in due time you will have on your hands an overgrown clerkly generation you have trained up in their youth to depend on Government allowances, and to look to Government service, but whose adult ambitions not all the offices of Government would satisfy. What are you to do with this great clerkly class, forced under a foreign system, without discipline, without contentment, and without a God ? The day will come when your State Educators will be faced with the results. They will find out that races who for ages have borne a heavy yoke throughout life cannot be trained up without discipline in their youth. They will also discover that the end of national education is not to create one vast clerkly class, but to fit all classes for their normal work. The Government will discern the danger of millions of men growing up in a discredited faith, and will piece together a moral textbook to take the place of God. I shall not see that day, but night and day I pray that wisdom may be given to your rulers to know the times and

the seasons, and do righteousness to this wandering people."

Missions

I have sometimes been asked : " Do the results of Indian Missions justify the expenditure on them ? "

To this I would reply, " You cannot measure the salvation of souls by £ s. d. You might as well try to measure Infinity with a two-foot rule. Moreover we know absolutely nothing about results. We know the seed has been sown, but to what extent it has fructified, is fructifying or will fructify, God only knows. It is not a question of the past or the present, but of the future.

Considering the discouragements and hindrances of past years to missionary effort, and the fact that only sixty years ago a bill was passed rescinding all laws that involved loss of rights and property to any native that might embrace Christianity, the results so far as we know are very good. . . .

Impatience of results is the bane of missionary work ; it induces the sacrifice of quality to quantity of the converts, and tends to throw discredit on missionary effort.

The Tinnivelly Mission was carried on for sixty-four years with so little apparent success that the resident missionary was on the point of being

removed when he received a deputation of natives which informed him that ninety-six villages had agreed to abandon idolatry and embrace Christianity.

There are now 60,000 native Christians in that mission.

Missionaries

From a letter sent to the Head of a Mission newly arrived in India :—

February 25th, 1874.

I trust you will not consider the remarks I made to you yesterday were intended to discourage you. I believe a great work is to be done, but that much waste of energy may be avoided by a careful study of the errors that have led to the failure of others. Too often many earnest men forget the precept to be as wise as serpents while they are as harmless as doves. Too great haste is made to make individual converts rather than to influence the masses. . . . It is a sad and humiliating fact that English rule as it extends spreads a fearful increase of vice and intemperance. Missionary efforts should, if possible, go hand in hand with a temperance movement. Care should be taken not to break down the restraints which natives have themselves imposed to check vice. No attempts should be made to alter their system and anglicise

it, except in those points where it is radically vicious.

Let missionaries, before they begin a work of demolition, build up some foundation for the new edifice. Let them instil into the native mind an admiration for the beauty of holiness—let them teach the natives to love Christian principles and see their value—let them set an example worthy of imitation.

Let the missionaries lay aside abstruse and difficult questions, bringing into greater prominence the two points on which hang all the law and the prophets. If it is necessary to enter into argument let all argument be sound and logical, for the native is a subtle reasoner. . . .

It appears to me that your plan of beginning from the centre and spreading gradually is good, but to work your way you must enlist native agency largely to aid you. To succeed you should at first try unbroken ground and avoid those places where your influence will be counteracted by the bad example set by Europeans.

Converts not unfrequently embrace Christianity for the sake of the licence they suppose it affords them. It is necessary therefore to impress upon the natives that, far from giving them licence to

vice, Christianity imposes upon them the most stringent restraints. I have travelled over a large portion of India, Burmah and Ceylon, and have seen much failure and much reason for failure. . . .

Every thoughtful man must feel that there is much that deserves careful study. . . . I believe it will amply repay you to investigate for yourself the points which I have indicated before you launch out fully upon a well-digested scheme of missionary labour.

With every wish for your success.

Believe me to be,

Yours very truly,

GUILFORD L. MOLESWORTH.

General Dyer—Amritsar, April 13th, 1919

It is, I think, unfortunate to suggest that because some of us feel that General Dyer has not received justice, we should be stamped as taking the part of Anglo-Europeans against the Indians. There are a great many Indians fully alive to the fact that General Dyer really did save an appalling situation. Labour naturally knows nothing about it, nor, in fact, do English people generally. Only the lovers of India know the truth.

Twenty-six years ago Lecky sounded a warning

against the danger of democracy for India. He said : " The great danger that menaces India is to be found neither at Calcutta nor at St. Petersburg, but at Westminster. . . . It is to be found in the introduction into India of modes and maxims of Government borrowed from modern European Democracies utterly unsuited to an Oriental people. It is to be found in acts of injustice perpetrated by Parliament in obedience to party motives and to the pressure of local interests."

Notwithstanding this warning the Secretary of State has forced democracy on India against the almost unanimous desire of her administrators and educated public.

In pursuance of this policy he has, with the assistance of Indian agitators, stirred up revolt and rebellion, which has resulted in murder, arson and outrage. Inflammatory and criminal posters called upon the mob in the name of " the blessed Mahatma Ghandi " to outrage European women (*The Pioneer*, May 31st) ; what would those who have been clamouring loudest for vengeance upon General Dyer say if incitement of this character were directed against their own wives and daughters ?

General Dyer's courage in attacking an overwhelming force with only a handful of Sikh soldiers has saved

India from much carnage ; but instead of being commended he was disgraced to the indelible shame of the Coalition Government and of Mr. Montague.

Admiral Byng was shot for not doing that for which General Dyer has suffered. . . . The real culprits were those who failed to send him (Byng) reinforcements. (*British Naval Biography*, page 213.)

In the same way, as a friend writes to me : "The view I take is that the whole move is a political one and has little to do with O'Dwyer or Dyer, or what they did or did not do. They have been merely thrown to the wolves to placate Mr. Montague's Indian friends."—(June 10th, 1920.)

Economic Problems

Between a bad and good economist this constitutes the whole difference : the one takes account of the visible effects, the other takes account both of the effects which are seen, and also of those which it is necessary to foresee. Hence it follows that the bad economist pursues a small present good, which will be followed by a great evil to come, whilst the true economist pursues a great good to come, at the risk of a small present evil.—(F. Bastiat, *Essays on Political Economy*.)

Tariff Reform

The greatest and most plausible objection that Free Traders make to protection is based on the fallacy that it means the shutting out of foreign goods.

This shows a failure to recognise the distinction between Protection and Prohibition. Protection merely means placing the British manufacturer and agriculturist on an equality with foreign nations who, under our "Free Trade" policy, are enjoying unfair advantages of free import into our country while our own goods are heavily taxed.

I am in favour of Tariff Reform because our present fiscal policy is not free trade in any sense of the word. The term Free Trade (*libre échange*) means the free exchange of commodities between nations, which England has never had since 1846. The policy pursued by this country for the last sixty years is not the Free Trade of Adam Smith, Mill, Sir Robert Peel, or McCulloch. . . .

The prosperity which we enjoyed in the "fifties," although unfairly claimed as the work of "Free Trade," was due to other causes, namely, gold discoveries, inventions in science, steam navigation, railways, etc., which have been shared by foreign nations. Having laid the foundations of our industrial prosperity under Protection, and having

thereby secured the command of the world's markets, we were not merely the *first*, but for many years the *only* country able to utilise these new forces that then came into play ; and for more than 20 years, fortuitous events, such as the Crimean War, Civil War in the United States, and Continental disturbances in Europe, retarded the progress of foreign nations ; but as soon as foreign Protectionist Nations were able to avail themselves of the new industrial conditions, they successfully competed with us, even in our own markets, and, our country is now flooded with the productions of those very nations whom we formerly supplied.

Since that time many of our industries have been ruined, and have practically disappeared : our agriculture, silk, sugar-refining and other important industries have been seriously injured, and others are struggling hard for existence.

Direct taxation is increasing to an intolerable extent ; capital is fast leaving the country.—
(Written in 1813).

Protection of Home Industry

The War, by stopping the unlimited free import of German and Austrian manufactures, has afforded us an opportunity of reconstructing our lost

industries, and immediate action was necessary so that our manufacturers might be in a position to supply the demand that must arise so soon as the war was over. But it is impossible, for manufacturers to lay down the plant necessary to regain lost ground, unless they have some guarantee that their struggling industries will not be swamped by unlimited foreign imports.

Government should therefore have adopted some distinct policy that would have to embody the following points :--

- (1) To secure employment and good wages to our workers.
- (2) To draw our revenue from foreign nations, instead of taxing our own subjects.
- (3) To open an immense market in our Colonies and Dependencies, by reciprocal and preferential treatment, and to furnish us with supplies at moderate rates. Their raw materials coming in free.

By "raw materials" is meant such articles as cannot be produced at home—such as tea, cocoa, cotton, etc. Unfortunately Government has put a stop to the reconstruction of our industries by its fatuous policy of state payment to the unemployed

at a critical time when the employment of labour is of the highest importance.

On a Neglected Source of Revenue

In the present financial crisis, when the nation is verging on bankruptcy, and there is a talk of largely increasing our already intolerable burden of direct taxation, we are recklessly neglecting an enormous source of revenue from indirect taxation. Supplies of all kinds are now pouring into England from Germany and other countries, which, if taxed, would produce a magnificent revenue : but this measure has not been adopted owing to the prevailing fallacy that it would increase the cost of imported articles.

Whereas "if an article is, or can be produced at home, the imposition of a duty on it is followed by a fall in price of the article taxed ; and *vice versa*, the abolition of a tariff is followed by a rise of price."

In "Economic and Fiscal Facts and Fallacies," I have given innumerable instances of such results in different countries and at various times ; and also an explanation of the causes which have produced this apparent paradox.

To some minds such a result appears impossible,

but a careful consideration of the question may help to explain it :

- (1) Before the import duty comes into force, there is a rush on the part of the foreign producer, or his agent, to send in as much produce as possible so as to escape the duty. This naturally has a tendency to depress prices, and the fall is rendered permanent by development and competition in the home market.
- (2) The home manufacturers, being protected from wholesale dumping of surplus goods, are in a position to carry on their industry on a more satisfactory footing than before.
- (3) The foreign producer must sell his surplus produce, and the import duty is borne by him.
- (4) The revenue brought in from import duties saves direct taxation, and the home producer is thus enabled to produce at lower rates than when heavily taxed.
- (5) A foreign monopoly which has maintained high prices is often killed by an import duty.

On the Income Tax

(From the *Westminster Gazette*, September 6th, 1902.)

Sir Guilford . . . is an old public servant, with years of official experience and a record of good work

done for his country. . . . He was born so far back as 1828, being now in his seventy-fourth year. He does not, therefore, discuss the income-tax grievance with the inexperience of youth. Sir Guilford, whose manner is full of old-time courtesy and charm, talked yesterday with a *Westminster* representative on the topic which is more immediately engaging his attention. *Punch*, he pointed out, had recently cartooned in its own inimitable way the "patient ass" staggering under an oppressive load of taxation. . . . The tax, Sir Guilford was careful to point out, does not relieve the working-classes. "No truth in political economy is more certain than that a heavy taxation of capital which starves industry will fall most heavily on the poor." He quotes this passage from Lecky. "Mr. Gladstone denounced the income-tax" observes Sir Guilford, "as a demoralising tax. It must always be a dangerous tax, and it is clearly the one among our imposts through which revolutionary or even democratic finance may most readily carve a road to the confiscation of property."

It was introduced by him as a temporary measure. It was not his intention to retain it as a portion of the permanent and ordinary finance of the country—and he pledged himself to the reduction of it from 7d. to 6d. in two years, to 5d. in three years more,

and to abolish it altogether in three years more ; but before the last three years had expired he had raised it to 10d. It is with us yet, but instead of being 10d. it is 1s. 2d.

[This article resulted at the time (1902) in numerous meetings, held in the City of London, to protest against the income tax ; but, like other movements, it came to an end owing to the usual apathy of the public.—ED.]

(From an article written by Sir G. L. M. on March 21st, 1907.)

The income tax is essentially a war tax. . . . It is the height of folly to draw upon our reserves in times of peace, leaving no reserve upon which we can draw in any national emergency . . . *it encourages political extravagance.* . . . In its indirect action it is detrimental to national wealth, it tends to drive away productive capital, and has a pernicious effect upon our industries. . . .

(1921 Extract from letter to the Anti-Waste League.)

The income tax is at present the most powerful factor in the political extravagance from which we are now suffering. Without its aid squanderers could not indulge in their extravagance.

It is a milch cow from which they can draw without check or hindrance to an unlimited extent.

Decimal Currency

The advantages of this system are great, it saves much labour and risk of error in accounts. It does away with the necessity for compound multiplication and division ; and people with very small knowledge of arithmetic will be able to make a practical use of it in keeping accounts. The change from the present system would be so slight and simple that a child might be made to understand it in a few minutes.

To make the system applicable to Great Britain it is desirable to bring the pound into it. The terms would be "Pounds, florins and cents" (f. f. c.). The halfcrown, crown, double florin and threepenny-bit might remain for a short time in circulation as if 25c., 2f. 50c., 2f., and 12½c. respectively ; but they are unnecessary, and their mintage should be discontinued.

To carry out the decimal system the mintage of only three kinds of copper tokens would be required—one, two and five cent. pieces ; the silver coins and notes circulating unchanged in value.

The difference between the new and old copper tokens (only four per cent.) would be so small as to be practically negligible ; but to avoid even the appearance of injustice they might be made interchangeable at the rate of 96 farthings to 100 cents.

The florin-cent. currency is identical with the pound-mil; but the former has the advantage of a two-figure instead of a three-figure column for the tokens. Moreover the word "mil" is used to express the thousandth part of an inch.

The Currency of India

"The currency of India is now in a condition which is a complete violation of all sound principles of currency. It consists of a huge inconvertible token coinage, practically a gold standard without a gold currency, or even a gold reserve. The rupee circulates at a value much above its intrinsic value as bullion. It is no longer international money. . . . The double standard is in perfect accord with sound economic laws; but the artificial raising of the rupee is opposed to them, and being a violation of all monetary laws must sooner or later end in disaster."

—(*Indian Currency*, by Sir G. L. M., published in *Annals of the American Academy*, January, 1891.)

If the Monetary Conference at Brussels in 1892 had adopted the system of bi-metallism, it would have avoided the scarcity of metallic money and consequently the gold famine from which we suffered during the War. Mr. Giffen has stated that in almost every year since 1873 there has been a stringency

of greater or less severity directly traceable and more or less aggravated by the extraordinary demands for gold, and the difficulty of supplying them.

Fortunately, England, although her currency was nominally mono-metallic, practically enjoyed the benefits of bi-metallism until 1873, and so long as Europe as a whole remained practically bi-metallic, England in all her vagaries was kept tolerably straight by the double standard of France, which preserved the ratio of gold to silver *throughout the world* until the link was broken in 1873.

The Currency of India

The present condition of the currency of India is mainly due to the injudicious action of Great Britain, through its delegates, at the International Monetary Conference at Brussels in 1892, which rendered its proceedings futile, causing it to break up without arriving at any decision; consequently forcing on India that unsound currency from which she now suffers.

At that International Conference the following protest was made by me as delegate for India:—

"I regret the hasty and premature action of Sir Rivers Wilson in his uncompromising hostility to the Double Standard before an

opportunity could be allowed for its fair discussion in full conference . . . The Powers will not move without England . . . Indeed, I gather from conversation with many of the foreign Delegates that this is the prevailing impression . . . England holds the key to the position . . . Should this Conference break up without any definite result, then India must take immediate steps for its protection. Whether those measures will end in the stoppage of silver coinage and the adoption of gold coinage in some form or other I am unable to say. I cannot disguise from myself *that such a step is fraught with immense difficulties*, the result of which it is impossible to foresee."

England's Idolatry of Gold

It must be evident to everyone who has studied the subject that the English monetary system is most unsatisfactory. In 1828 Mr. Baring (no mean authority), pointed out the evils of our system, recommending a return to the double standard. He shewed that our monetary standard was subject to those sudden jerks and changes which are so fatal to credit and to commerce. He urged that our single gold standard exposed the country to

stringencies which cramped the currency, and increased distress. The Bank Act has, on several occasions, been either suspended, or on the verge of suspension ; and in 1858 Mr. Gladstone stated :— “ I cannot consent that the law should be suspended at intervals, to meet these constantly recurring crises. The Bank Act, damaged in 1847, was utterly shattered in 1857. Our Bank reserves are diminishing ; whilst our liabilities are largely increasing. They are inadequate to the necessities of the country, and are too small as compared with the gigantic liabilities we have incurred.”

In 1883 Mr. Williamson, M.P., called attention to the alarming manner in which the reserves of the Bank of England had diminished from our inability to maintain them, caused by the competition of foreign nations for gold.

During the ten years ending 1889 the proportion of cash to liabilities had fallen by 20 per cent. In the year 1881 the Bank reserves were £41,000,000 sterling. In 1891 they had fallen to £24,000,000. During the seven years 1893–90, the Bank of France only changed its rate of discount seven times ; while the Bank of England changed it sixty-two times. The variations in France only amounted to 2 per cent ; whilst those in England amounted to four

per cent. Mr. Goschen in the House of Commons said :—“ I feel a kind of shame that on the occasion of two or three millions of gold being taken from this country to Brazil, or any other country, it should immediately have the effect of causing a monetary alarm throughout the country.”

Then came the Baring failure, and our weakness was shewn by having to call France to our aid. The currency of France has weathered without difficulty storms to which the Baring failure was insignificant ; for example, the Franco-Prussian War, the Communistic struggle, the War Indemnity, the failure of the Panama Canal, of the metal ring, and of the Comptoir d'Escompte.

. 1860. *Bi-metallism*

Letter from Financial Secretary for Government of India :—

June, 1860.

Thank you for your valuable remarks on bi-metallism. It is encouraging to find that a judge so well qualified as yourself concurs in our views. I have long been fully persuaded. Your illustration is valuable. Another is two reservoirs fed from the outside by different springs and with different outlets but *connected* by a pipe. They

must stay at the same level if the pipe is only large enough.

The illustration to which the Financial Secretary refers was an analogy I had drawn between the equilibrium in bi-metallism, and the action of two metals in a standard of length, so combined, that the expansion and contraction of the one neutralised that of the other, thus maintaining the length unchanged notwithstanding the variations of temperature.

Socialism

Socialism has been defined by a "Christian Socialist" as: "The transfer of the land and industrial capital of this country from private ownership to the ownership of the State." It is not very evident how the transfer of land to the State will produce the Utopian results prophesied by the Socialists.

Only lately the Duke of Westminster offered his estate for sale to his tenants with the result that every tenant signed a request to the Duke, urging him to reconsider his proposal and to remain their landlord. No doubt there have been bad landlords as there have been bad men in all classes of the community; but the interests of landlord and tenant are inseparably bound together.

Mr. Hyndman, the well-known Socialist leader, has rightly said : " There is no word in Christianity about Socialism." The practice of the Early Christian Communities—consisting in *voluntarily* laying their own possessions at the feet of the Apostles—is *not Socialism*.—(*The Danger of "Christian" Socialism*, by Sir Guilford Molesworth.)

The "Socialism" of Kingsley and Maurice

The so-called Socialism of Kingsley and Maurice was neither more nor less than co-operative association. In Kingsley's preface to a late edition of *Alton Locke* he wrote : " If any man still represents the holders of property, as a class, as the enemies of those they employ, I believe that he is a liar, and the child of the Devil, and that he is at his father's old work—slanderizing and dividing between man and man. . . . "

" God grant that the workmen bestir themselves ere it be too late, and discover that the only defence against want is self-restraint, the only defence against slavery, obedience to rule ; and, instead of giving themselves up, bound hand and foot by their own fancy for a ' freedom ' which is but selfish and conceited licence to the brute accidents of the competitive system, they may begin to organise

among themselves associations for buying and selling the necessities of life."

This is bitterly opposed by Socialists, as is shewn by the following:—

"Co-operation is distinctly opposed to Socialism, and belongs to joint stock individualism."—(Webb. *Fabian Tract*, 51.)

"Co-operation is distinctly, so far from being Socialism, the very antithesis of Socialism."—(Belford Bax. *Religion of Socialism*, page 44.)

"The so-called thrift and temperance movements are essentially antagonistic to Socialism."—(*The New Catechism*, page 40.)

Socialism and Liberty

Speaking at the Sesame Club in reply to a resolution moved by Mr. Ramsay Macdonald, M.P., that "Socialism is just and practical and provides the only condition for individual liberty," Sir Guilford Molesworth, K.C.I.E., said: "O Liberty, Liberty! What crimes are committed in thy name!!! This was the pathetic cry of the gifted and brilliant Madame Roland when brought to the scaffold by the leaders of that Socialist movement of which she had been a moving spirit, for her *salon* had been the rendezvous of Robespierre, Brissot, Petion,

and many others of those Socialist miscreants, who brought her to the scaffold because her noble nature revolted against their tyranny and cruelty. It was in her *salon* that the outlines of the Social revolution were formulated, on the basis of the "Social Contract" of Jean Jacques Rousseau. To speak of Liberty in the same breath with Socialism is desecration. Even Herbert Spencer, the sympathetic defender of the labouring classes, declared in his essay "The Coming Slavery": "*All Socialism involves slavery.*" The liberty of the Socialist is the licence to rob, oppress, and enslave others. Liberty, equality, and fraternity have been the watch-words of Socialism in France, and what was their fruit? A wholesale slaughter of innocent men, women and children; and a fraternity which ended in the Socialist leaders bringing one another to the scaffold, until only Robespierre remained, and then he was guillotined amidst the curses and execrations of the populace. And did this bring liberty to France? No! On the contrary, absolute despotism under Buonaparte that lasted fourteen or fifteen years; plunged all Europe into war; and inflicted ruin upon France from which she has never fully recovered. Socialism is neither new nor untried. It has been tried over and over again; and always,

whether by State or private commune, with disastrous results. Seventeen hundred years ago, Æsop, in his fable of "The Members and the Belly," demonstrated the absolute folly of Socialism, and showed that the interests of labour and capital were identical and inseparable ; what injured one injured the other, and it was the recital of this fable that appeased a serious Socialist insurrection and riot in Ancient Rome. In 1848, the French Socialist Government, under Louis Blanc, yielding to the popular cry of "The Right to Work," instituted a system of National Works and Workshops, in spite of Lamartine's warning—that to do away with capital, in order to increase work, was like drying up a spring to increase the flow of water. However, the National Workshops were started, and, as might be expected, failed most disastrously ; the Socialist workmen, with their notions of equality, declined to do an honest day's work ; the Government was brought to the verge of bankruptcy ; the number of unemployed increased from about 8,000 to more than 100,000 ; and, as Lamartine told the National Assembly : "We all know the *rich idler*, but you have created a class—a hundred times more dangerous to themselves and to others—a class of *pauper idlers*." The sequel showed that Lamartine was

right ; for these 100,000 pauper idlers, congregated in Paris, broke out into insurrection which was only quelled after four days' hard street fighting, in which Paris was wrecked, 3,000 were killed, and 3,500 were arrested and deported to Algiers. Then occurred the inevitable result of such socialistic movements—absolute despotism under Louis Napoleon, which lasted twenty-two years, and only ended with the invasion of France by Germany and the defeat of the Emperor at Sedan. The majority of Socialist agitators openly preach the doctrine of class discord, envy, hatred, malice, robbery, irreligion, and immorality. I admit that there are, in the ranks of Socialists, many good-natured, well-meaning persons, who are duped with the idea that Socialism is to be the cure of those social inequalities which, if not created, have been greatly increased by our blundering socialistic legislation of late years. Others have been seduced by the alluring phrase of "Christian Socialism." Christian Socialism !! As well might one speak of Christian hatred, Christian robbery, Christian immorality, or Christian slavery. Mr. Robert Blatchford, the well-known Socialist Editor of the *Clarion*, says there are two kinds of Socialism—State Socialism and Communal Anarchy. Of the former, he says :—" No one who understands

the meaning of the terms 'liberty,' 'toleration,' or 'equality,' could live under State Socialism ; *it would be a hell.*" I quite agree with Mr. Blatchford ; but unfortunately, the vast majority of Socialists favour State Socialism, which appeals to the lowest instincts and passions of mankind ; and it is these men who always come to the front in Socialist movements just as the scum rises to the surface of troubled, dirty water. The liberty of the English people was gained some 800 years ago by the Lords who forced King John to sign the Magna Charta. This Charter protected every individual in the realm, high or low, in the free enjoyment of his life, his liberty, and his property, and it called the British Parliament into existence. The Lords, to use the words of Lord Chatham, " did not confine it to themselves, but delivered it as a common blessing to the *whole* people." We are now losing that liberty ; the despotism of the weak King John has now been replaced by the despotism of a weak Prime Minister, dominated by a Socialist minority, sufficiently strong, with the aid of the American-Irish-Roman-Catholic faction, to oust him from office if he refuse to obey their unconstitutional demands. Under this incongruous combination, arrogating to itself "*the voice of the people,*" the measures of the House of

Commons have, of late years, been marked by a series of unconstitutional attempts to infringe the principles of the Magna Charta, to encroach on the liberty of the subject, to violate trust deeds, contracts, and existing law, to practise class bribery on a gigantic scale, and to convert the law into an instrument of plunder. I have received many furious letters from Socialists who have taken offence at my letters to the public journals. One writer hoped to see the day when the guillotine would be erected on the Thames Embankment, and all the lords and great landowners brought under its knife. Another regretted that the would-be assassin, who shot at our late King at Paris, had missed his aim. A third wrote: "You talk of a 'plundering policy,' wait until we get into power, then you will know what plundering really means."

Another wrote: "The lords and landowners in Britain differ only in degree from the Bureaucracy in Russia. I read of their execution with grim satisfaction."

Now men of this sort invariably come to the front in Socialist movements while the moderate men who uphold liberty, justice, law and order are submerged and eventually enslaved.

On the House of Lords

No thoughtful man can contemplate without dismay the folly of the proposal to abolish the House of Lords. Out of its 632 members, 420 have held high positions, such as viceroys, governors, judges, high commissioners, privy councillors, cabinet ministers, generals, admirals, etc. No other Chamber in the world contains so many eminent and experienced statesmen. The need of an Upper Chamber has been proved by long experience, and there is scarcely a civilised country with any pretension to importance without one.

The charge that the House of Lords has constantly thwarted the will of the people is childish. Out of 230 measures sent up to the Lords during the period of 1906–1910 only six were rejected.

[ED.—Of these six, one was the Land Value Duties of 1909. The Lords tried to save us from it, and were broken. Through this Act, building enterprise went, with consequent loss of millions to the country and shortage of houses. . . . And now taxpayers have to groan under fresh burdens owing to the *subsidising* of housebuilding. . . . Yet, the Lands Act is buried in 1920 by the very people who, for political purposes, called it into being, amidst the

laughter of the House of Commons! (See Mr. Asquith's speech in *The Times*, April 21st, 1920.)]

On the House of Commons

A majority in the House of Commons no longer represents the voice of the people. The so-called "popular representation" has become a farce. A Member representing an electorate of 1,700 has equal voting power with a Member representing 27,000 electors! A re-distribution act is urgently required.

Under the present party system, debate is closed and the rights of private members have become so curtailed that parties have become mere machines worked by a despotic oligarchy.

It is impossible to overrate the importance of a reform of the House of Commons which lies at the root of all genuine social reform. Failing a prompt remedy the country will drift into a condition of State tyranny, under which the liberties and rights of the people must be irretrievably impaired.—(Reform of the House of Commons, 1913.)

The Referendum

The only fair mode of ascertaining "the voice of the people" is by means of the "Referendum," which has been incorporated into the Swiss Constitu-

tion since 1874, and into that of the Australian Confederation since 1897. It has also been adopted in the United States.

It is sound in principle, and simple in its application.

In Switzerland there are two Chambers :—“ The National Council ” and “ The Council of States.”

Both Chambers have equal rights on all matters, including finance. In case of disagreement between the two Chambers, unless a compromise can be effected, the matter is submitted to the Referendum, and the result of that submission is decisive.

In Switzerland, on the demand of 30,000 duly-qualified electors, the Federal Council issues an order for taking the vote by Referendum.

The vote (by ballot) is taken throughout the country on the same day.

Lord Ellenborough has lately said : “ The Referendum is, I believe, the only possible solution of the problem with which we are confronted. It is an honest method of giving the people what they want, instead of what a coalition of parties want to force down their throats.”

The adoption of a Referendum would practically result in a veto by the people instead of a veto by the Lords.

On Strikes

Strikes are economic blunders. The senseless outcry against capitalists (which fails to discriminate between productive and unproductive capital) does an infinity of mischief. The interests of employer and employed are inseparable ; that which injures the one injures the other. Trade Unions would be a positive blessing if confined to their legitimate function of defending the worker from injustice, etc. But, as at present run, they have become a positive curse to the worker and the poor.

Trade Unionists are but a fraction (less than one-fourth) of the Labour of the United Kingdom ; yet they tyrannise over the non-unionist majority, unjustly depriving them of the right to work, and refusing to work with them. The Trades Disputes Act of 1906 was denounced by the late Lord Chancellor as "a Bill for legalising tyranny, and a serious blow against the spirit of liberty which has reigned throughout our law." The interests of the workers are often sacrificed to the "influence of the union."

Sentimental Humanitarianism (1921)

"Sentimental humanitarianism—that deadly enemy of human welfare."

The principal propagandists of this mischievous

"humanitarianism" are social reformers in their various changes and disguises, whether Christian Socialists, Church Socialist League, Christian Social Union, Industrial Christian Fellowship, and other kindred associations; who, although actuated by the very best intentions, and with the praiseworthy aim of remedying the deplorable social conditions that exist, have by encouraging Socialism greatly increased the evils they seek to cure.

In toying with Socialism they have been like children playing with matches in a powder magazine, and we are now experiencing the effects of the explosion in unemployment to an appalling and unprecedented extent.

Industrial Christian Fellowship is an ideal which all thoughtful people should desire to be realised. But these propagandists, instead of shewing how industrial Christian Fellowship might be carried out in practice, by drawing employers and employed together in friendly consultation, by co-operation by co-partnership, by increased production, by proving that the interests of labour and capital are inseparable—are inclined to stir up enmity between employer and employed; it has excused on false grounds the dishonest shortage of production; it has bolstered up by fictional statements the Socialist

coal conspiracy to ruin the employer and rob him of his property ; it has encouraged a Socialism that is not Christian and is opposed to fellowship ; and it has brought forward, in justification of the miners' wanton strike, " coal facts " which should have been termed coal falsehoods, and have been contradicted by the Report of the Coal Controller.—(Written 1921.)

On Co-partnership

The most practicable mode, however, of insuring industrial peace is by the adoption of the policy of co-partnership originated by Sir George Livesay in 1889 at the South Metropolitan Gas Works, which has been of inestimable advantage to employer and employed. In the twenty-fourth year of its operation the year's bonus earned by the members (which the first year had been £6,863) had increased to £48,000, and 5,900 employed were holding the Company's stock to the value of £370,000, besides many who had sold their shares, either in order to emigrate, or to buy houses, or to start business on their own account. Strikes in the South Metropolitan Gas Company have now become a thing of the past, and the relations between employers and employed have been all that could be desired ; forming a brilliant contrast to that miserable state of things that existed

both for workmen and officials of the Company when the influence of the Gas Workers' Union predominated.

Thirty-six gas companies, representing a total capital of upwards of £49,000,000 have since developed the principle of co-partnership, as well as 147 miscellaneous concerns, only seventeen of which failed, chiefly owing to Trade Union opposition.

The manager of the woollen cloth firm of Messrs. Taylor of Batley, after the policy of co-partnership had been in successful operation for eighteen years, wrote :—

“ It is almost impossible for anyone who has not worked under such a scheme, to appreciate the benefits it confers on every one concerned. Would it were more extended.”

Naturally the policy of co-partnership is bitterly opposed by Socialist trade union agitators, in that it weakens their influence, and puts a stop to strikes ; relegating the unions to their legitimate functions to expending their funds on sick, funeral and unemployed benefits.

Religious Problems—Personal Religion

(To his daughter on leaving home.)

You will probably be thrown among people of all shades of opinion, and may be confused and unsettled

in your mind by contradictory views and opinions held by those you admire. . . . People have quarrelled and are still quarrelling over the *husk* of religion, neglecting meanwhile the valuable portion, the *kernel*. My advice to you is: Do not disturb yourself or allow your mind to be unsettled by disputed questions, avoid the discussion of subjects that lead to no result except uncharitable feeling.

So many make the mistake of taking for their guide the *letter* instead of the *spirit* of the Bible. The first thing for you to do is to acquire an accurate idea of God; and to do so you must thoroughly understand the spirit of Christ's teaching. He teaches us to form our ideas of God from the analogy of a perfect Father loving and doing good even to his "unthankful and evil" children; anything opposed to this is opposed to the general teaching of Christ. An imperfect father may punish his child in anger, but a perfect father can only punish in love for the improvement of his child. . . .

Keep this idea of God as a leading principle and consider Christ's teaching:—

It inculcates a life of unselfishness and purity; it is entirely based on love. It teaches you so to live as to appreciate your Heavenly Father, to open out your heart to Him in love and prayer. Try to root

out all selfish considerations (for selfishness is the immediate source of sin and crime) ; live as far as you can a life devoted to others. No pleasure is like the exquisite pleasure of doing a kindness. . .

You have two definitions of religion, pure and undefiled : "To visit the fatherless and widow in their affliction, and to keep yourself unspotted from the world."

" To love God with all your heart and soul, and your neighbour as yourself."

Miracles 'from a Scientific Point of View'

(Written in 1857.)

This was written to shew the unscientific character of the so-called scientific objection to miracles.

There is no credulity so blind as the credulity of scepticism. There is no dogmatism so intolerant as the dogmatism of the pseudo scientist. I say pseudo, because the true man of science is modest, cautious and tolerant. . .

" A dogmatic habit of mind was till lately the special reproach of Theologians. It is a fault of which they have had bitterly to repent and their temper is now apt to be only too apologetic and cautious. Their dogmatism seems to have been transferred to the minds of men of science." (Virchow.)

(1920.)

Sixty-four years ago I was reproved by an analytical chemist of some standing for hazarding the belief that valuable as the then existing system, of chemistry then was, it contained only partial truth and would eventually give place to a more perfect theory, and that the "elements" would probably be found to be resolvable when new laws of combination had been discovered. I was told I had no right to put forth such a supposition, as the atomic theory had been so incontestably proved in innumerable instances as to render doubt impossible. . . . Yet I have lived to witness a complete revolution of chemical science. . . .

Norman Lockyer has decomposed an element—

"If there is one thing clear about the progress of modern science, it is the tendency to reduce all scientific problems to problems in molecular physics, yet these ultimate particles, molecules or atoms, *are creatures of the imagination.*" (Huxley.)

"The very existence of these molecules is entirely based on unproved assumptions," (Professor Clark Maxwell.) etc., etc.

Scientists themselves now own up to the fallibility of science. It was painful in the old days to see the attempt to get rid of an intelligent Creator.

"Everlasting" Punishment

Punishment is the necessary consequence of sin, whether in this world or the next, but the doctrine of its "eternity" is unscriptural; the word "æon" which has often appeared in the Bible to justify that doctrine, does not mean a state of duration long or short. In some twenty-eight passages in the New Testament it is used in a sense that cannot possibly be infinite, nor has it been so translated.

Some light may be thrown on the use of the word by the Gnostics who flourished at a time when Greek was not a dead language. They held that there were thirty æons, such as Truth, Mind, the Word, Wisdom, Christ the Saviour, etc., and that God was the complement of them all. The sentence "These shall go into everlasting punishment" should be read "These shall go into Æonian Pruning," as the Greek word *καλασις*, translated "punishment," is really "pruning."

The doctrine of the eternity of punishment has evolved out of the various changes of language. In the same way: "Prevent us, O Lord" originally meaning, "Go before us, O Lord," now reads as though it had the opposite meaning.

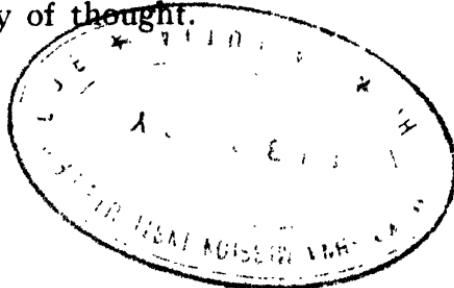
Religious Unity

Parties in the Church, if dealt with in a spirit of toleration, are a positive advantage.

Unity in the Church is essential, but absolute uniformity is an "Ignis Fatuus" the pursuit of which destroys unity.

Strife and dissension are caused by the endeavour to narrow down God's Truth to our individual standard. The Church, its creeds, sacraments, discipline, doctrines, and ritual are of incalculable value if rightly used as means to attain an end ; but only valuable as such. Owing to the element of human weakness there must be a certain admixture of error in all religious systems and *such error is proportional to the extent to which any system attempts to explain the Indefinable, to know the Unknowable*

Anyone who has carefully studied the thirty-nine articles cannot fail to be struck with the liberal spirit in which they have been framed so as to provide for diversity of thought.



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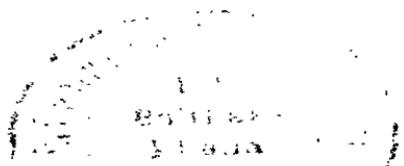
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